metal ... the news digest magazine

Volume XXVII-No. 2 February, 1954

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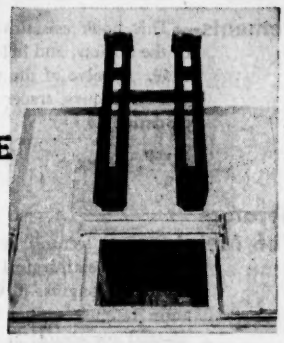

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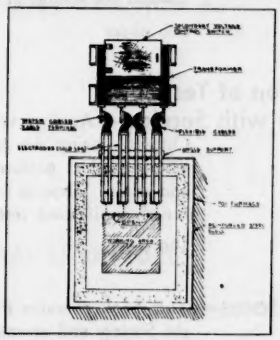
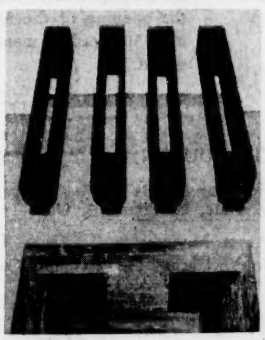


Drawing of HOLDEN TYPE 701-4 Submerged Electrode Furnace.



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Metals Review

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CONTENTS

JUNIOR MEMBERS' PLACEMENT SERVICE 17

Midwinter Meeting—Tentative Schedule of Meetings 4

IMPORTANT LECTURES

Heavy Press Requirements, by Alexander Zeitlin 5
Gas Carburizing, by Walter Holcroft 6
Welded Pressure Vessels, by a Panel at Utah 7
Recrystallization, by Paul A. Beck 8
Metallurgical Sleuthing, by S. W. Poole 10
History of Iron and Steel, by R. F. Miller 11
Advertising to Sell, by R. C. Lowe, Jr. 12
Oil and Gas Well Corrosion, by W. F. Oxford, Jr. 14
Drop Forging Techniques, by N. A. Harrison 15

DEPARTMENTS

Important Meetings 6, 16
Obituaries 12
Meet Your Chapter Chairman .. 13
New Films 15
Employment Service Bureau 60

ASM REVIEW OF METAL LITERATURE

A — GENERAL METALLURGICAL 36
B — RAW MATERIALS AND ORE PREPARATION 37
C — NONFERROUS EXTRACTION AND REFINING 37
D — FERROUS REDUCTION AND REFINING 38
E — FOUNDRY 39
F — PRIMARY MECHANICAL WORKING 40
G — SECONDARY MECHANICAL WORKING 41
H — POWDER METALLURGY 43
J — HEAT TREATMENT 43
K — JOINING 44
L — CLEANING, COATING AND FINISHING 46
M — METALLOGRAPHY, CONSTITUTION AND PRIMARY STRUCTURES 49
N — TRANSFORMATIONS AND RESULTING STRUCTURES 50
P — PHYSICAL PROPERTIES AND TEST METHODS 51
Q — MECHANICAL PROPERTIES AND TEST METHODS; DEFORMATIONS 53
R — CORROSION 56
S — INSPECTION AND CONTROL 57
T — APPLICATION OF METALS IN EQUIPMENT AND INDUSTRY 58
V — MATERIALS 59

A.S.M. Midwinter Meeting

Tentative Technical Program
Statler Hotel
Boston, March 4-5, 1954

Thursday, Mar. 4

2:00 p. m.—Georgian Room

PHYSICAL METALLURGY

Solution and Precipitation of Aluminum Nitride in Relation to the Structure of Low Carbon Steels, by W. C. Leslie, Thompson Products, Inc., R. L. Rickett, U. S. Steel Corp., C. L. Dotson, Southern Research Institute, and C. S. Walton, Crucible Steel Co. of America.

Roles of Aluminum and Nitrogen in Graphitization, by E. J. Dulis and G. V. Smith, Research Laboratory, United States Steel Corp.

Effect of Grain Size and Carbon Content on the Low-Temperature Tensile Properties of High-Purity Fe:C Alloy, by R. L. Smith, Franklin Institute, and C. Spangler and R. M. Brick, Department of Metallurgical Engineering, University of Pennsylvania.

Effective Diameter of Solute Atoms in Interstitial Solid Solutions, by Rudolph Speiser and J. W. Spretnak, Associate Professors of Metallurgy, and W. J. Taylor, Ohio State University.

8:00 p. m.—Georgian Rooom

HARDENABILITY

Alpha-Molybdenum Hot Work Die Steels, by R. B. Corbett, Director of Research, J. A. Succop, Chief Metallurgical Engineer, and A. Feduska, Heppenstall Co.

Thermal Reproducibility of the End-Quench Test, by John Birtalan, R. G. Henley, Jr., and A. L. Christenson, Timken Roller Bearing Co.

Analysis of Hardenability Under Marquenching Conditions, by C. M. Carman, D. F. Armiento and Harold Markus, Metallurgists, Frankford Arsenal.

The Influence of Heat Treating Variables on the Martensite Transformation in SAE 1050 Steel, by M. R. Meyerson and S. J. Rosenberg, National Bureau of Standards.

Friday, Mar. 5

9:30 a. m.—Georgian Room

MECHANICAL AND NONFERROUS

Effect of Grain Size on High-Temperature Fatigue Properties, by J. E. Breen and J. R. Lane, Naval Research Laboratory.

Mechanical Anisotropy in Copper, by W. A. Backofen, Assistant Professor, A. J. Shaler, Massachusetts Institute of Technology, and B. B. Hundy, Scientific Officer, British Iron and Steel Research Association.

Effect of Prestrain Histories on the Creep and Tensile Properties of Aluminum, by Oleg D. Sherby and Alfred Goldberg, Research Engineers, and John E. Dorn, University of California.

Effect of Dispersions of $CuAl_2$ on the Elevated Temperature Tensile Properties of Al-Cu Alloys, by C. D. Starr and R. B. Shaw, Research Engineers, and John E. Dorn, University of California.

2:00 p. m.—Georgian Room

STAINLESS

The Formation of Sigma Phase in Types 309 and 310 Stainless Steel, by R. C. Frerichs and C. L. Clark, Metallurgical Department, Timken Roller Bearing Co.

Precipitation Hardening in Austenitic Chromium-Nickel Steels Containing High Carbon and Phosphorus, by A. G. Allten, J. G. Y. Chow and A. Simon, Research Laboratory, Crucible Steel Co. of America.

The Substitution of Manganese for Nickel in 16-25-6 Alloy, by Wells E. Ellis, Research Metallurgist and M. Fleischmann, Timken Roller Bearing Co.

Work Softening of 16-25-6 Alloy at Elevated Temperatures, by Douglas A. J. Millar, Instructor, and John Wulff, Massachusetts Institute of Technology.

Thursday, Mar. 4

10:30 a. m.—Parlor A

PRODUCTION OF METAL AND REFRACTORY COMPOUNDS

(*Beryllium Symposium*)

Reduction to Metal:

Reduction of Beryllium Metal From Beryl by Way of the Fluoride, by Henry C. Kawecki, Kawecki Chemical Co.

Reduction of Beryllium Metal From Beryl by Way of the Sulphate, by C. W. Schwenzfeier, Jr., Brush Beryllium Co.

Fabrication of Beryllium by Powder Metallurgy, by W. W. Beaver, Brush Beryllium Co.

Beryllium Cermets and Ceramics:

Refractory Compounds and Cermets, by W. W. Beaver.

Beryllia as a Refractory, by J. T. White, Division of Research, Atomic Energy Commission.

2:00 p. m.—Parlor A

FABRICATION OF BERYLLIUM METAL

(*Beryllium Symposium*)

Mechanical Working Processes:

Extrusion of Beryllium, by P. Loewenstein, A. R. Kaufmann and S. V. Arnold, Massachusetts Institute of Technology.

Rolling, Forging and Similar Processes, by C. E. Lacy, Knolls Atomic Power Laboratory.

General Machining Methods for Beryllium, by J. M. Case and E. R. Watkins, Carbide & Carbon Chemicals Co., Y-12, Oak Ridge.

Joining, by D. C. Martin, Battelle Memorial Institute.

Plating and Cladding, by J. T. Stacy, Battelle Memorial Institute.

Friday, Mar. 5

10:00 a. m.—Parlor A

PROPERTIES OF BERYLLIUM AND ITS ALLOYS

(*Beryllium Symposium*)

The Brittleness and Ductility of Beryllium, by A. R. Kaufmann, D. W. Woodward, G. Tuer and J. L. Klein, Massachusetts Institute of Technology.

Metallography of Beryllium, by M. C. Udy, Battelle Memorial Institute.

Corrosion of Beryllium, by R. F. Koenig, Knolls Atomic Power Laboratory.

Beryllium-Rich Alloys, by A. R. Kaufmann.

2:00 p. m.—Parlor A

BERYLLIUM'S ROLE IN MODERN INDUSTRY

(*Beryllium Symposium*)

Historical Notes on Sources and Uses of Beryllium, by R. F. Griffith, Rare & Precious Metals Branch, U. S. Bureau of Mines.

Health Hazards of Beryllium, by Merril Eisenbud, Health & Safety Division, Atomic Energy Commission.

Role of Beryllium in the Atomic Energy Program, by R. E. Pahler, Division of Engineering, Atomic Energy Commission.

Role of Beryllium in Industry, by N. W. Bass, Brush Beryllium Co.

New Jersey Smoker Entertains 1100

An Overflow Crowd of More Than 1100 Attended the Annual Christmas Smoker of the New Jersey Chapter. Entertainment committee chairman J. J. Hauptly of J. T. Ryerson & Son (left) and vice-chairman F. B. Poole, Peter A. Frasse Co. (right), joined chairman W. Hughes White, Hoyland Steel Co. in welcoming the throng. (Reported by John L. Everhart for New Jersey)

Details Heavy Press Requirements in N. Y.

Speaker: Alexander Zeitlin

Loewy Construction Co., Inc.

Alexander Zeitlin, vice-president of the Loewy Construction Co., Inc., gave a talk on the United States Air Force "Heavy Press Program" at a meeting of the New York Chapter. He briefly reviewed the program and described the forging and extrusion presses in design and construction. In summary, he stated that the present program consists of two integrated forging plants, each with two presses of 35,000 and 50,000 tons, respectively, and of a larger number of extrusion plants with presses of 8000 and 12,000 tons capacity.

He covered the economic and technical aspects through which the heavy presses will facilitate the design and construction of modern aircraft, reviewing weight savings, and machining and metal economies. For example, a certain aircraft part uses rough initial weight of 2200 lb., while the finished weight is only about 700 lb. Therefore, an integral forging will offer substantial metal economy and savings in machine shop hours.

Mr. Zeitlin described some of the important features of heavy press design with particular emphasis on design considerations involved, photoelastic studies conducted specifically to solve certain problems peculiar to the prototype designs involved, and production problems resulting from large size parts utilized. An idea of some of these problems can be obtained from the following dimensions of the 50,000-ton press: weight—11,000 tons; length of columns—108 ft.; maximum pressure—61,000 tons.

It was found that the conventional design of columns would reach its limits with a press size of about 18,000 tons. Heavier columns cannot be forged through to the core. The special shape threads cannot be machined and the intimate cooperation between columns and platens and the matching of deflections cannot be achieved. Mr. Zeitlin covered the particular features of the design finally chosen which included columns consisting of a number of laminations and other designs based on photoelastic studies and stress analyses. Technological advantages of extruded materials as well as the auxiliary operations such as billet casting, straightening and stretching, homogenizing and other types of heat treatment were discussed.

The speaker also illustrated several interesting extrusion operations such as the extrusion of hollow steel propeller blades and integrally extruded gun barrels.—**Reported by Arthur Tesman for the New York Chapter.**

Speaks on Process Control At Joint North Texas Meeting

Speaker: W. H. Sparrow

Chance Vought Aircraft Corp.

The North Texas Chapter of the American Society for Metals and the local section of the American Society for Quality Control held a joint meeting at which W. H. Sparrow, chief of process control, Chance Vought Aircraft Corp., spoke on "Metallurgical Process Control".

Mr. Sparrow outlined the various types of tests involved and how they are integrated in receiving and control of materials in process. A moving picture on "Aluminum" was also shown.—**Reported by Irving H. Comroe for North Texas.**

Austin Presents Science Award to Student

During the National Officers Night Meeting of the Mahoning Valley Chapter a First-Place Award Was Presented to Arthur Dunkle, a 14-Year Old Ninth Grade Student at Boardman High School of Youngstown, for His Entry in the A.S.M.'s Science Achievement Award Program. Arthur's project was "Statistical Study of Manganese Analysis of a B111 Steel". Shown at the presentation are, from left: K. L. Fetters, technical chairman; National President James B. Austin, who spoke on "Nitrogen in Steel"; Arthur Dunkle; and E. J. Fisher, chairman. (Reported by J. D. Anderson, Jr.)

Gas Carburizing Topic in Western Ontario

Walter Holcroft, Who Spoke Recently Before the Western Ontario Chapter, Is Shown With a Group of Members at the Speakers' Table. From left are: H. M. Gregory, Holcroft Furnace Co. Ltd.; I. S. Reid, Ford Motor Co. of Canada, Ltd.; P. Banwell, Walker Metal Products, Ltd., Chapter chairman; Mr. Holcroft; and R. Waddington, Dominion Forge and Stamping Co. Mr. Holcroft gave an informative talk on "Gas Carburizing"

Speaker: W. H. Holcroft
Holcroft & Co.

In a talk on "Gas Carburizing" before the Western Ontario Chapter, Walter Holcroft, Holcroft & Co., presented his material in as nontechnical a fashion as the complicated nature of the subject would permit.

As a preamble he reviewed briefly the types of furnaces used—classifying them as batch or continuous types—as to heating methods—gas, oil, electricity or coal—and as direct (in which products of combustion are allowed to envelope the work) and indirect (in which the heating medium does not come in contact with the work). Indirectly heated furnaces are used for gas atmosphere work.

Mr. Holcroft went back 70 years to trace the history of gas carburizing. The basic principles of present-day gas carburizing were outlined in a book by Haslam and Russel in 1926, and in 1934 work was started on the first furnaces to incorporate these principles in the clean hardening of steel with carbon control.

Three things are required for operation of a gas atmosphere furnace. First is gas-tight heated chamber, which may be an alloy muffle or refractory-lined steel case, radiantly heated. Second is a prepared gas to envelope the work and prevent contamination in the furnace, and third is the introduction of sufficient hydrocarbon gas to give the necessary carbon addition to the steel.

Mr. Holcroft then explained the two most important reactions in gas atmosphere work, the first involving the release of carbon from carbon monoxide, with the formation of carbon dioxide, and the second involving the formation of carbon monoxide and hydrogen from carbon and water vapor. He showed how the equilibrium constants for these reactions are related to the carbon content of the steel; as the percentage of carbon at the surface of the steel is decreased, the allowable carbon dioxide and water vapor in the gas at equilibrium with that surface increases. A third reaction, called the water-gas reaction, gives a means of predicting what percentages of CO_2 and water vapor will be in the furnace if the analysis of the gases entering the furnace is known.

The speaker explained the use of Orsat analysis and dewpoint readings for checking furnace atmospheres, and showed how rate of carburizing varies as a function of time. An understanding of this latter factor is necessary, he pointed out, for it has caused more controversy between purchaser and furnace builder than any other single factor in gas carburizing.

Mr. Holcroft closed his talk with a quick glance at corbonitriding, which he said is a process in which ammonia is added to the carburizing atmosphere.—**Reported by C. G. Robinson for Western Ontario.**

Iron Carbon Alloy Talk Given at Birmingham

Speaker: Warren C. Jeffery
University of Alabama

The Birmingham Chapter heard Warren C. Jeffery, associate professor of metallurgical engineering at the University of Alabama, deliver a talk on "Iron Carbon Alloys" at its December meeting. Attendance at this meeting was exceptionally good, indicating the continued interest of the members of the chapter in the speakers and subjects chosen for their technical meetings.—**Reported by Walton P. McCord for Birmingham Chapter.**

Ottawa Valley Conducts Novel Educational Series

The educational series of the Ottawa Valley Chapter this year was conducted in a novel way. The instruction was presented in the form of films illustrating the subject, followed by open discussion, with the lecturer acting as discussion leader. This procedure gave those participating an opportunity to observe the various processes before the lecture and permitted them to visualize the subject as the lecturer explained it.

Titles of films used and lecturers included: "Heat Treating Hints" . . . G. B. Craig; "Corrosion in Action" . . . T. V. Simpkinson; "Microscast" and "Jet Propulsion" . . . H. V. Kinsey; "General Sheet Metal Practice", "Blanking and Piercing", "Spinning" and "Drawing, Stretching and Stamping" . . . J. A. Perry; "Heat Treatment of Aluminum" . . . J. W. Meier.

This procedure of presentation of the series was a departure from the method used in previous years. The success of this method was evident from the sustained attendance throughout the series.—**Reported by S. A. Agnew for Ottawa Valley.**

IMPORTANT MEETINGS *for March*

Mar. 15-19—National Association of Corrosion Engineers. Tenth Annual Conference and Exhibition. Kansas City. (A. B. Campbell, Executive Secretary, N.A.C.E., 1061 M & M Bldg., Houston 2, Tex.)

Mar. 17-19—Pressed Metal Institute. Fifth Annual Spring Technical Meeting. Hotel Carter, Cleveland. (E. M. Ross, Secretary, P.M.I., 2860 E. 130th St., Cleveland 20, Ohio)

Panel on Welded Pressure Vessels At Utah Chapter

A panel of four experts presented a discussion on "Welded Pressure Vessels" to a joint meeting of the Utah Chapters of the American Welding Society and the American Society for Metals. The panel consisted of: Robert C. Madden, works metallurgist, Columbia Geneva Steel Div., U. S. Steel Corp., E. D. Curtis, Consolidated Western Steel Div., U. S. Steel Corp., Norman Davis, Pacific Coast assistant manager, engineering service, Linde Air Products Co., and Fred V. Thomas, boiler and pressure vessel inspector for the State of Utah.

Discussion moderator was Heber C. Brimley of the Columbia Geneva Division of the U. S. Steel Corp.

Each panel member presented a short, informal talk on a particular phase of the subject, after which the audience participated in a session with the panel members who contributed further discussion of the questions from the audience.

Mr. Madden described the different grades of steel produced by the mills for use in welded pressure vessels. He emphasized the importance of vessel fabricators being familiar with the A.S.T.M. specification steels with which they are working. He also gave a short explanation of the manufacturing differences in killed, semi-killed and rimmed steels.

Mr. Thomas pointed out the various codes which more or less constitute the welded pressure vessel fabricator's "bible". Mr. Thomas stressed safety in both life and materials as the prime reason for the adoption and enforcement of the codes. The pertinent rules and codes are flexible to the extent that they are being constantly up-dated to take into consideration new materials and methods in the manufacture of welded pressure vessels. He gave an accurate description of how to obtain an A.S.M.E. stamp, and touched upon the nature of inspection methods and procedures for registering a welded pressure vessel.

Norman Davis talked about submerged arc-welding and its wide application in current production of welded pressure vessels. He presented details on plate preparation, weld metal properties, types of rod and melt, as well as the mechanical procedures involved in the submerged-arc process.

Mr. Curtis directed his remarks towards the practical problems in the fabrication of welded pressure vessels. Several slides of actual shop jobs were shown and Mr. Curtis described the course of several service failure investigations.

After Mr. Curtis' talk the audience presented questions which promoted interesting discussions, such as stress relieving and impact transition temperature. It was pointed out that stress relieving by the fabricators of welded pressure vessels plays an important role in minimizing service failures, particularly in the weld affected zone of pressure vessels. Instances were cited in which stress relieving is being carried out on certain jobs where the appropriate code does not require it. This is being done merely as a safety insurance on the part of the fabricators.

The problem of obtaining steel of sufficiently low transition temperatures for use in welded fabrication was discussed, and the panel pointed out the difficulties incident to this problem.

Failures in welded ship construction taking place during and after the last war precipitated extensive investigation which led to the conclusion in the literature that transition temperature is an important factor in the service of fabricated weldments. However, the panel pointed out that control of this factor by the steel mills is not practical at the present time due to the many variables which control the transition temperature of any given piece of steel.

Another question touched upon the benefits to be derived from the peening of welds on pressure vessels. There was some difference of opinion among the panel members in this regard. However, it was generally agreed upon that peening could not be used as a substitute for stress relieving.—**Reported by Don Rosenblatt for Utah Chapter.**

Illustrates Concepts of Machinability of Metals At Ottawa Valley Meeting

Speaker: F. W. Boulger
Battelle Memorial Institute

F. W. Boulger, supervising metallurgist, Battelle Memorial Institute, addressed the Ottawa Valley Chapter on the subject of "Machinability of Metals" recently.

Using visual aids, the speaker illustrated the different concepts of machinability as determined by such machine processes as turning, milling, drilling, etc. In most cases it appears desirable to use lathe tests for machinability ratings, and a description was given of a constant-pressure lathe which had been used by the speaker in a research program. A statistical study of the test results was given and a comparison made of the constant-pressure test ratings with tool-life tests and commercial machinability ratings. A remarkably close correlation was shown. The speaker showed that in lathe cutting, feed varies depending on properties of the material being cut.

The constant-pressure lathe test permits simple and rapid evaluations on small samples of material and the results indicate the probable performance in commercial machining operations. Machinability indexes measured by the constant-pressure lathe tests agree very closely with those obtained by the conventional labortory tool-life tests and commercial machining tests.—**Reported by S. J. Hayes for Ottawa Valley.**

Scholarship Awarded at Louisville

Edward Beaman, Freshman at the University of Kentucky's School of Metallurgy, Is Shown Receiving a Plaque From Harold J. Smith, Chairman of the Louisville Chapter, for Being Awarded an A.S.M. Scholarship in Metallurgy

Beck on Recrystallization at Oak Ridge

Paul A. Beck (Right) Professor at the University of Illinois, Is Shown at a Recent Meeting of the Oak Ridge Chapter Where He Gave a Talk on "Recrystallization". At left is E. E. Hoffman, Oak Ridge National Laboratory

Speaker: Paul A. Beck

University of Illinois

Paul A. Beck, University of Illinois, spoke on "Recrystallation" at Oak Ridge. Discussed annealing of cold worked metals and detailed recent experiments and current theories on recovery and recrystallization. Recovery, according to Prof. Beck, refers to certain property changes taking place without any perceptible change in the grain structure or subgrain structure. Recent experiments by Parker and associates on zinc single crystals deformed in shear, without bending, best exhibit this effect. Prof. Beck stated that Borelius and associates made a material contribution to our knowledge of this field by their recent measurements of energy released upon recovery in cold worked metals.

Prof. Beck also spoke about subboundary migration. Subgrains are detectable by X-ray microbeam techniques, electron transmission micrography and by special metallographic techniques. The subgrain size is a function of the temperature of deformation, of the rate of strain and of the total induced strain. It now appears that the subgrains form during deformation and not during annealing by the polygonization of continuously bent crystals. In the current theory, dislocations are thought to assemble into dislocation walls or subgrain boundaries during deformation. These subgrains grow on annealing by the migration of subboundaries, a process associated with a decrease of interface energy in the system. Under certain conditions, this may proceed until the metal is completely softened without recrystallization, that is, without the migration of high-angle boundaries.

Finally, Prof. Beck described recrystallization and how it may proceed in a material already strain-free by the subboundary-free structure growing into the grains containing subboundary structure. There are two stages in this growth process. In the first stage, when the growing grain is small in comparison with the matrix grains, the growth rate is very slow, since the driving energy comes from the "pull" of the subboundaries alone, and it is decreased by the energy necessary to extend the high-energy boundary of the growing grain. The second stage is much faster, with driving energy or pull being supplied not only by the subboundaries but also by the matrix grain boundaries themselves. This allows an interpretation of the macroscopically observed "incubation period" as the time for slow initial microscopic growth and it leads to an interpretation of the previously not well understood dependence of the macroscopic nucleation rate on annealing time. He concluded his talk with a discussion of recrystallization textures, where the problem is whether there are nuclei for only the observed orientation or whether other nuclei are also present and the resultant orientation depends on selective growth.

—Reported by David L. McElroy for the Oak Ridge Chapter.

Burgess of Gray Iron Founders Dies

Charles Owen Burgess, internationally known metallurgist and technical director of the Gray Iron Founders' Society, died at his home in Cleveland on Jan. 13, 1954.

Born at Little Falls, N. Y. in 1903, Mr. Burgess was graduated from Lehigh University in 1923 with the degree of metallurgical engineer. Prior to joining the staff of Gray Iron Founders' Society in 1948 he was head of the industrial service department of the Research Division of the Union Carbide & Carbon Corp.

He held more than a dozen patents in the steel and gray iron field and was a well-known author of technical articles on the metallurgy of iron and steel. At his death he was nearing completion of a gray-iron handbook for users of castings.

Mr. Burgess was an active member of the following organizations: American Society of Metals, American Foundrymen's Society, American Society of Testing Materials, American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, National Academy of Science, American Ordnance Association and the American Society for Quality Control. He has served on a score of committees in these and other organizations.

Spray Painting Classes Set

The DeVilbiss Co. is offering one-week courses of instruction in industrial spray finishing methods during the weeks of Feb. 8, Mar. 15, Apr. 26, May 24 and June 21 at the school adjoining the company's main plant in Toledo. Applications for the school, now in its 28th year of operation, may be obtained by requesting Form INS-753-A from the De Vilbiss Co., Toledo 1, Ohio.

Austin Made a "Colonel"

James B. Austin, National President A.S.M., Received a Commission as a Kentucky Colonel From Charles K. O'Connell, Secretary of the State of Kentucky, at the December Meeting of the Louisville Chapter. (Reported by F. F. Dietsch)

Cedar Rapids Chapter Holds Panel on Gears

The Cedar Rapids Chapter held a panel on "Gears" at a recent meeting. The panel was conducted by two exceptionally good speakers, Robert L. Sutherland, associate professor of mechanical engineering at the State University of Iowa, who represented educators and gear designers, and E. B. Smiley, sales engineer for the Illinois Gear and Machine Co. who represented gear manufacturers.

The session began with a film, "Principles of Gearing", which illustrated very effectively what a gear is, how motion is transmitted by means of gears and some of the fundamentals that must be considered in the design of the shape or profile of common gear teeth to transmit rotary motion smoothly and uniformly.

Prof. Sutherland then pointed out that in addition to the transmission of rotary motion in some predetermined ratio from one shaft to another, a gear usually must also transmit a certain force or power. When a designer starts out to select a pair of gears, he usually has certain things given, such as the input, the output and the power requirements. The size of the gears is usually governed by space limitations and pitch-line velocity limits. The designer tries to utilize gears as small as possible for compactness and low material cost. He uses gears with as many teeth as possible for maximum contact.

The first thing that a designer must determine is the load to be carried on the gear teeth in order to transmit the necessary power. Equations relating load to length, width, thickness and pitch of the tooth, and bending stress were presented.

In summarizing, Prof. Sutherland stated that in designing gears the quantities that enter into calculations are size of teeth, number of teeth, gear-tooth system which includes the pressure angle and type of teeth, pitch-line velocity, face width, machining accuracy, and the gear materials and heat treatment.

Mr. Smiley began his part of the program by considering the choice of materials and heat treatments and their relation to economical gear manufacture. A plain carbon steel gear with no heat treatment is not always more economical in the long run than an alloy steel or heat treated carbon steel gear.

For economical manufacture of accurate gears, it was suggested that if the hardness required is Brinell 240 or less, a 0.40 to 0.50% carbon steel forging or casting, to be machined after heat treatment, be specified. If the Brinell hardness falls between 240 and 320, an alloy steel of the S.A.E. 8600 or 4100 series should be specified, with the machining performed after heat treatment. If hardnesses above Brinell 320 are required, flame or induction hardening should be specified, either with or without pre-heat treatment depending on impact load requirements.

The same limitations apply to pinions as to gears: that is, Brinell 240 can be considered as the maximum hardness for the plain carbon steel and Brinell 320 for the medium carbon alloy steels. The hardness can be increased to Brinell 340 if a steel such as S.A.E. 4340 is available. If still higher hardnesses are required, a low carbon alloy steel carburized and hardened would be more economical. Alloy steels in the carburized and hardened pinions are recommended, because there is less distortion in heat treatment, which results in a more accurate pinion with better tooth bearing. Alloy steels also provide a tougher core for better support of the surface case.

These recommendations apply equally well to spur, helical or bevel gears. For worm gears, S.A.E. 65 alloy (89% Cu, 11% Sn) is recommended for the gear (as opposed to the worm). Nickel bronzes are also popular if they can be supplied by the foundry without hard spots. For the worm, A8620, A4620 and A2315 steels are recommended for carburizing to about 1/5 the tooth thickness and then hardening to Rockwell C-55 to 58. Higher hardness may cause cracks in grinding.

An enthusiastic question and answer session followed in which many interesting points in regard to all phases of gearing were brought out. **—Reported by Edward M. Mielnik for the Cedar Rapids Chapter.**

Lube Conference at Fenn

Industrial engineers from five states attended Fenn College's first Lubrication Engineering Conference, held Jan. 14 and 15, at the college in conjunction with the Cleveland Section of the American Society of Lubrication Engineers.

Purpose of the two-day meeting was to provide educators and engineers with an opportunity to exchange ideas, techniques and information on lubricant properties, equipment, gear and bearing application, reclamation and other topics.

Alcoa Speakers at Jacksonville

From Left: Kenneth S. Bayless, Treasurer, Aluminum Tubing Co., G. L. Brinkworth, Aluminum Co. of America, Speaker, Chairman H. J. Huester, and J. B. West, Aluminum Co. of America, Speaker, Discuss the Talk on "Alcoa Aluminum and Its Alloys" Presented by the Jacksonville Chapter

Speakers: G. L. Brinkworth and J. B. West

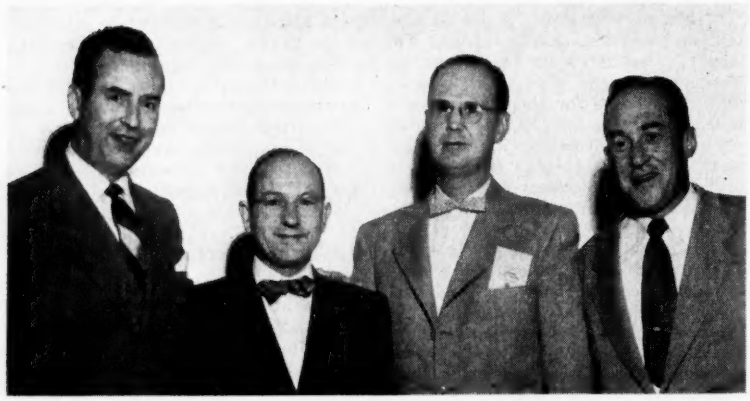
Aluminum Co. of America

The educational programs which have high-lighted the monthly meetings of the new Jacksonville Chapter were continued at the fourth meeting in December and will continue through meetings until April. In a young industrial area such as Jacksonville the members show great interest in learning more about the various phases of the metal fabricating business, as has been shown by the good attendance at the meetings and the steadily growing membership of the Chapter.

"Alcoa Aluminum and Its Alloys" was the subject discussed by J. B. West, technical consultant, and G. L. Brinkworth, in charge of sales promotion, Aluminum Co. of America, Atlanta. The speakers preceded their talk with movies showing the forming and welding of aluminum alloys, with emphasis on the tungsten arc and consumable electrode methods.

One of the guests of the Chapter was Kenneth S. Bayless, secretary-treasurer of the Aluminum Tubing Co., Spokane, Wash., which has recently announced that it will move its entire business to Jacksonville. He was introduced by Sid Foster of the Jacksonville Chamber of Commerce, who stressed the industrial opportunities that still exist in Jacksonville, which has surged forward industrially during the past few years.—**Reported by C. E. Wright for the Jacksonville Chapter.**

Discusses Metallurgical Sleuthing



Sidney W. Poole, Republic Steel Corp., Discussed "Methods for Analyzing Failures" at a Combined Educational and Regular Meeting of the Los Angeles Chapter Recently. Shown are, from left: J. E. Wilson, Climax Molybdenum Co.; D. S. Clark, California Institute of Technology; Mr. Poole; and J. A. Chalk, Jr., Bethlehem Pacific Coast Steel Corp., chairman

Speaker: Sidney W. Poole

Repblic Steel Corp.

Culminating a successful educational series by combining the fifth and final lecture with a regular chapter meeting, the Los Angeles Chapter enjoyed a discussion of "Methods for Analyzing Failures".

Sidney W. Poole, supervisor of development, Canton Metallurgical Laboratory, Republic Steel Corp., summarized the tools which the metallurgist has at his disposal. These had been thoroughly discussed at the four preceding educational program meetings by leading experts in this field.

Leading from the tools, Mr. Poole, through a series of examples, showed how each could be used to explain why a machine part failed before it was expected to. One of the points stressed was that a failed part more likely than not will look perfectly sound under the microscope and will show the desired properties when tested in tension or impact. Nonetheless the part has failed and the metallurgist must look to other reasons than "poor" material. Design or processing may be the culprits. Residual or "built-in" stresses can defeat the metallurgist's best efforts in selection of materials and the same holds true for poor design practice.

A frequent cause of service failure is fatigue. Here hardenability can play an important role and by examination of microstructure it is possible to determine if the heat treating has been properly done or if the wrong steel for the section size involved has been selected. Failure to achieve on quenching a full or at least 90% martensitic structure, particularly in highly stressed areas, will result in a lowered endurance limit for the part and the possibility of early fatigue failure. Examples of premature fatigue failures of alloy steel shafts which had actually been placed in service in the annealed condition were illustrated.

Using the ultrasonic reflectoscope to test a 24 in. diameter by 54 in. long pin in a 126-ton two-throw crankshaft provided a vivid illustration of one of the newer inspection tools. The pin was circumferentially cracked but not sufficiently deep to prohibit operation. By regular measurement of progression of the crack during service, it was possible to maintain a blooming mill in production for a period of six days longer than would have been possible if only the presence of the crack was known but not its magnitude.

Mr. Poole concluded an excellent talk with the premise that with the judicious use of metallurgical tools now available, and an appreciation of design with particular attention to the effects of design on service life, the metallurgist can do much to analyze and often prevent failures.—**Reported by F. R. Kostoch for the Los Angeles Chapter.**

Tatnall at Columbia Basin

Speaker: Francis G. Tatnall

Baldwin-Lima-Hamilton

Francis G. Tatnall, manager of testing research, Baldwin-Lima-Hamilton Corp., spoke on "Translation of Laboratory and Field Tests Into an Improved Product" before a meeting of the Columbia Basin Chapter. Mr. Tatnall explained how the familiar objects of today, from aircraft to office furniture, are made stronger and lighter when tests are made on full-sized parts and components.—**Reported by Louis D. Turner for Columbia Basin Chapter.**

X-Ray Diffraction Course

The sixteenth session of the semi-annual X-Ray Diffraction School will be held at North American Philips Co., Inc., 750 S. Fulton Ave., Mount Vernon, N. Y., during the week of April 19-23. Registration for the week-long school will be limited to 125 for the first four days and to 150 on Friday, this day being devoted to actual application problems when guest speakers discuss details on methods currently in use in research and industrial laboratories and plants. Write directly to the company for registration blanks and further information about the course. There is no registration fee.

St. Louis Presents Award to Student

A Science Award Was Recently Presented to Edmond Richards (Third From Left), 17-Year Old Student at Belleville Township High School, Belleville, Ill. His entry "An Original Approach to Radio-Carbon Dating" won First Prize in the competition sponsored by A.S.M. and conducted by the National Science Teachers Association. Shown at the presentation are, from left: J. W. Neckers, Southern Illinois University, N.S.T.A. representative; Hal O. Hall, Principal of the high scrool; Edmond; and C. W. Messinger, St. Louis Chapter representative, who made the presentation

Speaker Discusses History and Future Of Die Castings

Speaker: William N. Brammer
Apex Smelting Co.

William N. Brammer, assistant sales manager, Apex Smelting Co., discussed the "History and Future of Die Casting" before the Dayton Chapter at a recent meeting.

Mentioning the difficulties encountered using the early zinc-base die castings when they contained considerable aluminum, Mr. Brammer told of the A.S.T.M. program started in 1927 to develop better characteristics in the alloys. It was discovered that while additions of magnesium would diminish the detrimental effects of high aluminum, zinc of 99.99% purity was required for stability of dimension and properties. Later, it was found that if the magnesium were cut from 0.1% down to 0.04%, zinc-base casting alloys containing 4% aluminum and made of this high-purity zinc gave good castability with permanence of properties. In the alloy of today, tin and lead are controlled to a very low maximum to get reproducible stability.

Although zinc-base die castings have certain advantages over aluminum, such as lower temperature operation of the die-casting machines, there are about as many aluminum die castings made today as zinc. Larger die castings being made for such things as automotive parts, development of processes for plating on aluminum, better die steels for more intricate castings and longer life are just a few of the items which point toward a good future for aluminum die castings especially.

A popular aluminum alloy for die casting will have about 9% silicon for maximum fluidity, a little copper to help yield strength, plus a zinc addition for advantageous operation by the cold chamber process. Whereas the early zinc-base alloys with aluminum were unstable due to impurity content, the addition of zinc to aluminum-base die casting alloys is usually advantageous. Corrosion resistance is not affected by zinc and there is a great improvement in machinability when about 2% zinc is present. Further, specifications must allow for copper and zinc additions to obtain less costly alloys because of ready availability of scrap for raw material supply.

One of the main points brought out regarding casting failures was that with a high-production process like die casting it is essential that metal compositions be the same from day to day. This requires close and uniform control of metal composition and scientific handling practice for the molten metal.—**Reported by D. C. Heckard for the Dayton Chapter.**

Dayton Hears History of Iron and Steel

Richard F. Miller, United States Steel Corp., Spoke on the "History of the Iron and Steel Industry" at a Recent Meeting in Dayton. Shown are, from left: W. T. Bryan, chapter treasurer; J. Gavin, University of Dayton football coach; Dr. Miller; and J. G. Gantner, chairman

Speaker: Richard F. Miller
U. S. Steel Corp.

Dayton Chapter heard Richard F. Miller, assistant to the vice-president, research and technology, United States Steel Corp., speak on "The History of the Iron and Steel Industry", at a recent meeting. Using slides to illustrate the comparison in design between ancient stone articles of commerce and their first metal equivalents, Dr. Miller traced the progress of the iron and steel industry up to the 1900's.

Illustrations of early methods used in making iron and steel were shown and discussed. Processes such as the Catalan forge gave way in the 14th century to the two stage process—in the first step, the ore was reduced and melted, allowing for solution of carbon. In the second step, the carbon was reduced by remelting and the slag was "pounded" out, giving a low-carbon which could be worked into useful articles. It was a process similar to this that was used by the ironworkers at Hammersmith in Massachusetts Bay Colony in the 1640's.

The restoration of this site of the first successful ironworks in America, on the banks of the Saugus River near Boston, is being sponsored by the American Iron and Steel Institute in conjunction with historians, geologists and architects. Fast becoming a leading tourist attraction in the area, the "First Iron Works" is a symbol of the beginnings of our industrial economy. A slide film of the iron works was shown.

There are succeeding phases of historical interest in the development of iron and steel technology. The iron furnace at Cornwall near Harrisburg, Pa., constructed in 1740, is still in existence. Cast iron from this furnace was a source of armament in the Revolutionary War. The 19th century brought analytical chemistry to help the metallurgist. In 1856 a patent was issued to Robert Mushet for the addition of spiegeleisen to blown metal, and 1866 saw the end of the patent controversy between Kelley and Bessemer regarding the pneumatic process for steelmaking. The combining of these three patents gave the first real impetus to the steel industry, with great increases in production in the succeeding years. Then in the early 1900's, with the development of the various related sciences and such tools as the metallurgical microscope, metallurgy started to make the transition from an art to a science.—**Reported by D. C. Heckard for the Dayton Chapter.**

Welding Contest Announced

The Pandjiris Weldment Co. has announced a national essay contest in which the contestant will be required to submit a short essay on the advantages of positioning the weldment, welding head, the welder or a combination of these. The essay should give a clear-cut description of the application and type of equipment used. The contest will run from Jan. 1 through Apr. 30, 1954. First prize will be $500, second $250, third $150, and fourth and fifth prizes $50. Winners will be announced sometime before the first half of 1954.

Those interested in this contest should write for rules and entry blanks to: Phil Sackbauer, Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo.

Chapter Yearbooks Available

All local chapter secretaries of the American Society for Metals have on hand the yearbooks of most of the other chapters. A.S.M. members are at liberty to request the addresses of members and sustaining member companies from their chapter secretaries if the information is available.

Stresses Importance of Advertising in Selling On Competitive Market

Speaker: Robert C. Lowe, Jr.
Lowe & Stevens

Members of the Georgia Chapter were told they must coordinate their advertising and selling if they expect to "go the distance in a competitive market". Robert C. Lowe Jr., partner in the advertising agency of Lowe & Stevens, addressed the Chapter at its December meeting in the fourth in an educational series of discussions on "Advertising, Marketing and Sales Promotion".

Mr. Lowe said that advertising is only one function in moving goods from the manufacturer to the ultimate user. Advertising can go only as far as you make it go. With salesmen's costs per call constantly climbing, Mr. Lowe emphasized the need for trade paper advertising to conserve salesmen's time, to make it possible for them to make more calls and possibly more sales.

"If you can eliminate the time it takes your salesmen to sell the company—to tell who you are and what you make—if you can cut down the time it takes to arouse interest in your products—and if you can eliminate or reduce the time it takes to crate preference for your products", Mr. Lowe said, "then your salesmen might possibly make two calls for every one they are now making".

The first step in coordinating advertising and selling is to tell your salesmen what your advertising is doing for them. Salesmen should be given not only the names of publications being used, but what kinds of publications they are, who reads them, and why advertisements in these publications are saving their time. Salesmen should be told about the continuity of advertising campaigns, the themes or reasons behind the advertising. Not only the salesmen but the management and salesmen in all of the distribution channels should be given this information.

Seven steps to coordinate advertising and selling and follow-through were outlined by the speaker:

1. Plan advertising as far in advance as possible.
2. Furnish everyone concerned with a copy of the plan and schedule.
3. Send *preprints* of advertisements to the sales forces and distribution channels.
4. Tell the same story in your advertising that your sales people tell in person.
5. Make up your mind that it is going to cost money.
6. Realize this type of program calls for planning, forethought and creative thinking.
7. Follow through.

Mr. Lowe also told how the advertising agency fits into the overall picture. He stressed the functions of today's advertising agency and stressed the importance of the agency's services beyond the fundamental ones of preparing advertisements.—**Reported by Fred O. Reese for Georgia Chapter.**

Discusses Titanium At Tri-City Meeting

Speaker: Donald Luster
Rem-Cru Titanium, Inc.

The Tri-City Chapter heard Donald Luster, supervisor of engineering development, Rem-Cru Titanium, Inc., speak on "Developments in Titanium" in December.

Mr. Luster traced the history of the development of titanium for commercial uses, and he used slides to illustrate the processes used in its production. He stated that the metal was not a rare one, since the raw materials needed for its production exist in quantity, but the processes needed to produce it make it expensive. Slides illustrated titanium's mechanical properties in comparison with steel and aluminum. Numerous advantages in its applications which result from the superior properties inherent in the metals were pointed out. Use of titanium is limited at present to applications which require these superior properties and where the cost can be justified.

The speaker also discussed the forging and machining of titanium. Conventional practice does not vary greatly from the accepted practices used with other metals.—**Reported by George W. Baldwin for the Tri-City Chapter.**

Obituaries

Emanuel J. Janitzky

Emanuel J. Janitzky died in December at the age of 72. Mr. Janitzky, who wrote extensively on metallurgy, retired in 1945 after 30 years with the Carnegie-Illinois Steel Co. He was the Henry Marion Howe Medalist in 1922.

Charles Stallwood

Charles Stallwood, assistant chief metallurgist for Allison Division, General Motors Corp., died early in January. A native of Birmingham, England, he attended Purdue and was a graduate of the General Motors Institute. He had been a metallurgist with Allison Division for the last 18 years.

Emmett W. Beebe

Emmett W. Beebe, secretary of the San Diego Chapter, died early in December of a heart attack. He was employed by Consolidated Vultee Aircraft Corp.

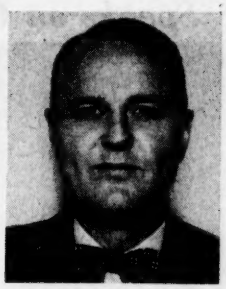
North Texas Hears Talk on Toolsteels

At a Meeting of the North Texas Chapter, J. D. McConnell, International Nickel Co., Spoke on "Precision Investment Castings". Shown are, from left: Fred E. Stanley, past chapter chairman; Irving H. Comroe, secretary; and Mr. McConnell. (Reported by I. H. Comroe for North Texas)

Meet Your Chapter Chairman

H. N. Arbuthnot

Art Westerman



Robert L. Stark

WASHINGTON

HERBERT N. ARBUTHNOT (Arby) was born in East Liverpool, Ohio. His first job after graduating from Washington and Jefferson College in 1914 was as foreman in the Weirton plant of the Weirton Steel Co. He is now assistant to the president of the Allegheny Ludlum Steel Corp.

Besides serving the Washington Chapter in various offices since 1948, Arby has found time in his busy schedule to be chairman and to fill positions with the National Security Industrial Association and the American Ordnance Association in various official capacities.

Sports, as both participator and spectator, have been Arby's abiding hobby since his school days, when he was a varsity trackman at Washington & Jefferson. He plays golf and is an avid baseball and football fan. Among his clubs are the Detroit Athletic Club, Oakmont Country Club, the Red Run Golf Club of Detroit and the University Club of Washington.

COLUMBUS

ART WESTERMAN has a remarkable ability for integrating technical science with psychology and coming up with research results, his coworkers say. While Art is a metallurgist by training and experience, it is his knowledge of science in the broad sense and his understanding of people which best explain his present position on the staff at Battelle Memorial Institute in Columbus. Art is responsible for the coordination of a number of related research projects involving 200 people. His office is a virtual clearing house for both policy and technical information regarding these projects—an office to which many Battellites come to give and receive information and to discuss the personal aspects of their work. Art's visitors invariably come away with a feeling of confidence inspired by his enthusiasm.

Art was born, reared and educated in Pittsburgh, received his B.S. in metallurgy from Carnegie Institute of Technology in 1939 and did graduate work in alloy steels and advanced mechanical metallurgy at Carnegie Tech from 1939 to 1943. Concurrently, he was employed as assistant metallurgist at Crucible Steel's Park Works in Pittsburgh. He served later as a research metallurgist at Carnegie Institute of Technology and was principally interested in the size effect in armor plate.

Since joining the Battelle staff in 1943, he has worked on more than a dozen projects, ranging from an evaluation of enemy equipment during World War II to a basic study of vitallium alloys. Most of his research work at Battelle has centered on metals other than steels. During his professional career, Art has had the good fortune of being closely associated with such noted metallurgists as Robert F. Mehl, Maxwell Gensamer, Frederick N. Rhines and Charles S. Barrett at Carnegie Tech, and Howard C. Cross and the late Horace W. Gillett at Battelle.

Art and his wife, Edythe, are the parents of two children—Richard, 9, and Linda, 6. The youngsters have made scouting a family project. Art enjoys gardening and "home maintenance" as well as reading and playing the piano. He refuses to elaborate on his golfing.

In addition to A.S.M. Art's technical affiliations include Tau Beta Pi, Sigma Xi, and Phi Kappa Phi. For more than three years, Art was the able editor of the *CTC News,* monthly publication of the Columbus Technical Council. His most recent technical publications have been on "The Cobalt Chromium Binary System" and "Microconstituents in Chromium-Base Chromium-Iron-Molybdenum Alloys and Their Behavior With Heat Treatment".

ROCKY MOUNTAIN (DENVER)

ROBERT L. STARK, a graduate of the Colorado School of Mines, received his degree as engineer of mines in 1931. He spent several years working underground in the metal mines in Colorado and did some placer mining in Idaho before taking a sales and service engineer position with the Crucible Steel Co. of America.

In 1942, Mr. Stark was called to active duty with the U. S. Army Engineers. He helped to build the Alcan Highway in the Yukon Territory of Canada and Alaska. Following this he served with the U. S. troops in Australia, New Guinea, Dutch Halmaheras, and he was in on the invasion of Luzon in the Philippines. He holds the rank of major with the Army Reserves.

In 1951 he was made branch manager of the Denver Branch of the Crucible Steel Co. of America. He is a charter member of the Rocky Mountain Chapter and a member of the Colorado Engineering Council.

MILWAUKEE

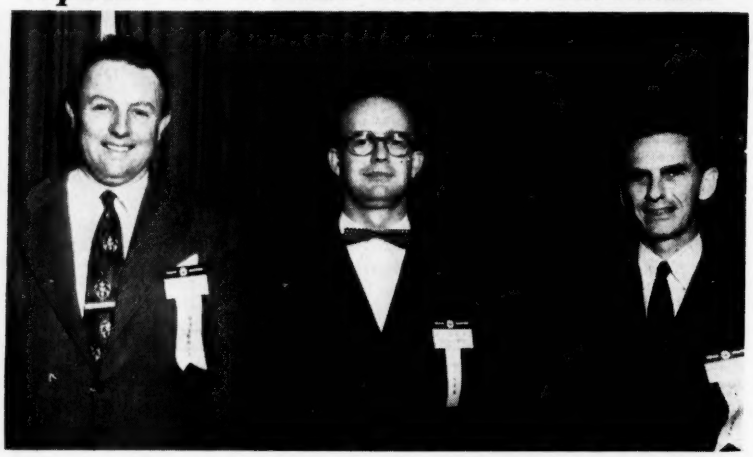
ELMER GAMMETER was born in St. Louis, Mo., and received his professional education at the School of Mines and Metallurgy at the University of Missouri, where he graduated with a B.S. degree in 1926, an M.S. degree in 1927, and a metallurgical engineer degree in 1932. He has two children, a boy and a girl, now in college. He and his wife are active in church and P.T.A. work in their suburban home in Whitefish Bay, and he fishes whenever the opportunity presents itself and prefers the streams of his native state. For an indoor hobby he turns to art and has some creditable examples to prove it.

Elmer's professional career started with the Midvale Co., Philadelphia, after which he went with the Western Electric Co. in Chicago. In 1931 he joined the Edison General Electric Appliance Co., where he had a major part in the development of atomic hydrogen welding of heat resisting steel tubing used as sheathing for heating elements in household appliances. In 1937 he went to the Stainless Steel Bureau, metallurgical division, U. S. Steel Corp., and became manager in 1940. In his present position as director of laboratories at Globe Steel Tubes Co., he has ample chance to utilize his wide experience in applied metallurgy.

Elmer Gammeter

Mr. Gammeter got into committee work in the Chicago Chapter A.S.M. very early in his professional career. He was on the executive committee and was chairman of the Chicago Chapter in 1937-38. The combination of a pleasing personality and quiet effectiveness made him an easy choice for A.S.M. national trustee in 1950-51.

Speaks on Oil and Gas Well Corrosion



W. F. Oxford, Jr., Sun Oil Co., Discussed "Oil and Gas Condensate Well Corrosion" Before a Joint Meeting of A.S.M. and N.A.C.E. He is shown with Arthur R. Oakley, Jr., vice-chairman (left), and W. Mack Crook, chairman of the chapter. (Photograph by Lee Dolan for the Texas Chapter)

Speaker: W. F. Oxford, Jr.
Sun Oil Co., Gulf Coast Div.

The Texas Chapter, in a joint meeting with the local chapter of the National Association of Corrosion Engineers, heard W. F. Oxford, Jr., of Sun Oil Co., present a discussion on "Oil and Gas Condensate Well Corrosion".

In discussing gas condensate well corrosion, Mr. Oxford described organic acids and carbon dioxide as being the chief offenders. He discussed the use of nickel alloy and chromium-molybdenum alloy tubing, plastic-coated pipe and polar and semi-polar organic material as inhibitors. He emphasized that corrosion prevention is an economic necessity in some gas condensate wells and gave an example of one well in which it cost $3.50 to produce a million cu. ft. of gas which dropped to $1.50 per million cu. ft. after inhibitors were added to check corrosion.

The speaker pointed out that there are two tples of corrosion—the water-dependent type and the water-independent type. Alloy tubing does not seem to improve corrosion resistance in oil wells as much as it does in gas wells. Plastic-coated pipe is good but is expensive and difficult to apply. Inhibitors are very difficult to get into the hole and down through the column of fluid to the bottom, and sometimes an accumulation of paraffin on the sides of the tubing makes it even more difficult.—**Reported by E. L. Von Rosenberg for Texas.**

Technical Papers Invited for A.S.M. Transactions

The Publications Committee of the A.S.M. will now receive technical papers for consideration for publication in the 1955 *Transactions* and probable presentation before a national meeting of the Society. A cordial invitation is extended to all members and nonmembers of the A.S.M. to submit technical papers to the Society.

Many of the papers approved by the Committee will be scheduled for presentation on the technical program of the 36th National Metal Congress and Exposition to be held in Chicago, Nov. 1-5, 1954, and the Western Metal Congress, Los Angeles, May 21-25, 1955. Papers that are selected for presentation will be preprinted. Manuscripts should be received at A.S.M. headquarters office not later than April 10, 1954.

Acceptance of a paper for publication does not necessarily infer that it will be presented. The selection of approved papers for the convention program will be made early in June.

Manuscripts in triplicate, plus one set of unmounted photographs and original tracings, should be sent to the attention of Ray T. Bayless, assistant secretary, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

Headquarters should be notified of your intention to submit a paper, and helpful suggestions for the preparation of technical papers will be sent.

Importance of Yield Point Stressed by Aust At Baltimore Meeting

Speaker: Karl T. Aust
Johns Hopkins University

Karl T. Aust, research associate, Johns Hopkins University, presented a discussion on the "Yield Point Phenomenon in Metals" at a meeting of the Baltimore Chapter.

The yield point effect is intimately related to such practical problems as the occurrence of Luders lines or stretcher-strain markings in mild steel and in certain aluminum alloys. The problem of the yield point is, therefore, of great importance from both a theoretical and applied standpoint.

The important experimental observations on the yield point were discussed first. The classic case is that of mild steel where the yield point is attributed to the presence of small amounts of C and/or N_2. Nitrogen is the solute responsible for yield points in other materials such as polycrystalline molybdenum, beta-brass crystals and single crystals of Zn and Cd. It has also been determined from very careful tensile and bend tests that plastic deformation before testing is not essential to the appearance of a sharp yield point.

Yield points may also occur in face-centered cubic materials such as alpha-brass crystals, single crystals of commercial aluminum and aluminum alloys, but not in super-pure aluminum crystals, and in polycrystalline Al-Mg alloys. However, much larger quantities of alloying elements are necessary to produce yield points in the face-centered cubic structure than in the body-centered or hexagonal structures.

The various theories advanced to explain the yield point were reviewed by Mr. Aust. The most successful theory is that due to Bilby and Cottrell, based on atmosphere formation of solute atoms around dislocations. The conditions necessary for "atmosphere" formation on the type of solute atoms required to cause the yield point were outlined.

The speaker stated that there are several criticisms of the dislocation theory of the yield point—the theory originally failed to explain the effect of grain size and the increased yield point effect in single crystals after strain aging. However, extensions of the dislocation theory have emphasized the importance of grain boundaries and stress concentrations in an effort to remove these criticisms. The dislocation picture successfully explains the many characteristics of the yield phenomenon, although quantitative treatment is still required to test the theory more precisely. **—Reported by Lewis H. Gross for the Baltimore Chapter.**

New Films

Making the Most of the Spray Painting Method

A 45-min. black and white sound film illustrating the four basic principles of spray finishing—proper equipment, control factors important to achieve highest quality results, techniques, and the care and maintenance of equipment, has been produced by the DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio. The film may be obtained by writing directly to the company.

Short Courses in Metals Planned at Penn State

A short course on "High-Temperature Properties of Materials" will be held at the Pennsylvania State University between June 21 and June 25, inclusive. Following this course, one on "Mechanics of Creep" will be conducted between June 28 and July 2. Authorities from industrial, governmental and educational institutions will give the lectures for both these courses. The programs are planned to give a broad coverage of high-temperature properties of materials and mechanics of creep by including physical, metallurgical and design aspects of these subjects. For further information, write Joseph Marin, Department of Engineering Mechanics, the Pennsylvania State University, State College, Pa.

Details Practical Aspects Of Drop Forging Techniques

Speaker: Norman A. Harrison

Nipigon Steel Forgings Ltd.

Norman A. Harrison, works manager, Nipigon Steel Forgings Ltd., spoke on the "Practical Aspects of Drop Forging" at a recent meeting of the Ottawa Valley Chapter.

Mr. Harrison stated that the historical roots of forging go very deep, understandably originating with man's first desire to use metal. Examples of early forgings are too well known to excite curiosity but it would be well to mention the value of the short sword and armor to the builders of the Roman Empire. During these early times, forging was strictly in the field of muscular metallurgy but it soon became apparent that the "armstrong" process was limited to small-sized ingots.

The advent of larger ingots led to the invention of the power-lifted drop hammer, originally water powered, then steam operated. The two main types today are the board and belt drop mechanical hammers and the steam and air power hammers. The latest major development in drop forging is the German contribution in which the anvil moves up to meet the falling hammer. This development does away in large part with the immense base support necessary for the standard drop hammer.

A major refinement in drop hammer techniques came with the advent of die forging, which necessitated the use of the term "Smith" forging for the standard method. The old straight guides (legs) of the drop hammer had to be redesigned and rebuilt until they had sufficient rigidity to allow the work piece to be forged off-center on the anvil. This redesign produced the present familiar leg design of the drop hammer.

A short discussion on die design revealed the necessity for draft, corner radius, guttering and flash allowance.

Mr. Harrison pointed out that the suitability of metals for the drop forging process is governed by their plastic characteristics at corresponding forging temperatures under static and dynamic loads. Some metals are amenable to the drop forging process while others can only be formed under static pressure.—**Reported by S. A. Agnew for Ottawa Valley.**

All's for Fun at Pittsburgh's Party

A Lively Interest in the Floorshow at the Annual Christmas Party of the Pittsburgh Chapter Is Being Displayed Here by (From Left) Max Kessler, Chairman of Entertainment Committee; George Enzian, Chapter Chairman; and Matty Pakkala and Alan Terrile, Members of the Entertainment Committee

Over 700 members and guests filled the Vogue Terrace dining room on Dec. 11 for the Pittsburgh Chapter's annual Christmas party. A general air of good will and friendliness, although notable at all chapter functions, was particularly in evidence at this party.

A choice of either roast turkey or shrimp was available at the dinner and the banquet moved along smoothly with everyone enjoying both food and fun.

The floor show consisted of a tightrope act, a song-and-dance team and a singer, accompanied by the local Brad Hunt orchestra. The highlight of this portion of the program was the participation of two well-known A.S.M. members, Tom McClintock and Max Kessler, along with the mistress of ceremonies, in an Andrews Sisters act. It is reported that these two were chosen to act because of their high-I.Q. rating. If the act were judged by the amount of applause, it was the best of the evening. In any case, Tom and Max were each presented with a giant lollypop for their efforts.

The second portion of the program, two dancing girls, commanded the closest attention to detail, a virtue in any group of technical men. The last part of the program, handled by Alan Terrile and Bill O'Donnell, consisted of distribution of prizes to the holders of lucky numbers. The dancing girls assisted in picking the numbers and distributing the prizes. The party was over about 10:30 and it was to the credit of the committee that everything moved in such an orderly sequence.—**Reported by L. A. Rodecker for the Pittsburgh Chapter.**

CHAPTER MEETING CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Akron	Mar. 17	Timken Roller Bearing		Plant Visit
Baltimore	Mar. 15	Engineers Club	B. H. Alexander	Diffusion
Boston	Mar. 5	Hotel Shelton	J. B. Austin	Magnification in Time
Buffalo	Mar. 11	Red Coach Inn, Niagara Falls	Marvin J. Udy	Developments in Extractive Metallurgy
Calumet	Mar. 9	Phil Schmidt's	I. Harter, Jr., and T. W. Ratcliffe	Continuous Casting of Steel
Canton-Massillon	Mar. 2	Mergus Restaurant	James H. Moore	Vacuum Metals
Chicago	Mar. 8	Furniture Mart	F. L. LaQue	Apparent Anomalies in Corrosion
Cincinnati	Mar. 11	Eng. Soc. Hqrts.	O. W. McMullan	Fundamentals of Metallography
Cleveland	Mar. 1	Hollenden Hotel	W. O. Everling	Structural Materials
Columbus	Mar. 3	Officers Club		Get Acquainted Smoker
Dayton	Mar. 10	Engineers Club	Bruce Gonser	Unusual Metals in Industry
Detroit	Mar. 8	Rackham Memorial Bldg.	R. G. Friedman	Hot and Cold Forging
Eastern New York	Mar. 9	Panetta's		Student Night
Fort Wayne	Mar. 8	Howard Johnsons	R. N. Snider	Anatomy of Humor—Ladies Night
Golden Gate	Mar. 8	El Curtola	Don Campbell	Fuel Combustion as Applied to Furnaces
Hartford	Mar. 9	University of Connecticut	Dr. Backofen	Training the Metallurgist
Indianapolis	Mar. 15	McClarney's	R. A. Flinn	Ductile Cast Iron
Kansas City	Mar. 17	Fred Harvey's		Cold Upsetting Titanium
Lehigh Valley	Mar. 5	Hotel Traylor	Harry Walp	Metallurgy of Ball and Roller Bearings
Los Angeles	Mar. 28	Rodger Young Auditorium		National Officers Night
Louisville	Mar. 2	5 and 1 Club	I. Harter, Jr., and T. W. Ratcliffe	Continuous Casting of Steel
Mahoning Valley	Mar. 9	V.F.W.	H. H. Johnson	Grossmann Lecture
Milwaukee	Mar. 16	City Club	H. P. Rassbach	Electric Furnace Melting of Alloy and Stainless Steels
Minnesota	Mar. 18	Covered Wagon	H. E. Scarbrough	Electric Furnace Brazing
Montreal	Mar. 1	Queen's Hotel	J. B. Austin	Magnification in Time
	Mar. 12	Queen's Hotel		Annual Stag Banquet
New Haven	Mar. 18	Hotel Barnum, Bridgeport	R. M. Brick	Present Status of Low-Temperature Brittleness Studies
New Jersey	Mar. 15	Essex House	K. A. Matticks	Drawing and Forming Stainless Steel
New York	Mar. 8	Hotel St. George	J. W. Spretnak	Hardenability in Boron Steels
Northwestern Pennsylvania	Mar. 25	Corry, Pa.	T. J. Voll	Powder Metallurgy and Sintering
Notre Dame	Mar. 10	Engineering Bldg.	Leonard Abrams	Atomic Energy
Ontario	Mar. 5	Royal York, Toronto		Ladies Night
Ottawa Valley	Mar. 2	P. M. R. L.	J. W. Lengbridge	Metal Flow in Deep Drawing Aluminum
Penn State	Mar. 9	Elec. Eng. Bldg.	R. B. Mears	Corrosion
Philadelphia	Mar. 19	Franklin Institute	R. H. Aborn	Versatile Low-Carbon Martensites
Philadelphia Junior Section	Mar. 19	Franklin Institute	R. H. Aborn	Sauveur Night Joint Meeting With Senior Group
Pittsburgh	Mar. 11	Ft. Pitt Hotel	H. N. Alyea	Young Fellows Night
Rochester	Mar. 8	C. of C.	J. H. Lansing and C. O. Burgess	Gray Malleable and Nodular Iron
Rockford	Mar. 24	Faust Hotel	F. D. Witmer	Surface Combustion
St. Louis	Mar. 19	Forest Park Hotel	E. N. Skinner	Factors Governing the Choice of Alloys for High-Temperature Service
Saginaw Valley	Mar. 16	Frankenmuth	H. W. Dietert	Precision Castings
Savannah River	Mar. 11	Commercial Hotel	J. R. Willard	Aluminum Manufacturing
Springfield	Mar. 15	Blake's Restaurant	C. G. Johnson	Fundamentals of Heat Treating
Syracuse	Mar. 2	Onondaga Hotel		Plastics
Texas	Mar. 2	Ben Milam Hotel	W. A. Mudge	Commercial Age Hardenable Alloys of Al, Mg, Zn, Cu and Ni
Tri-City	Mar. 2	Rock Island Arsenal	A. Brolin	Organic Finishes and Methods of Application
Tulsa	Mar. 2	Michaelis Cafe	G. A. Fritzlen	New High-Temperature Alloys
Utah	Mar. 25	Salt Lake City	A. T. Cape	Joining of Metals
Warren	Mar. 11	El Rio Restaurant	J. D. Grewell	Human Factors in Management
Washington	Mar. 8	Naylor's Restaurant	H. Dixon	Advanced Casting Techniques
Western Ontario	Mar. 12	Cobblestone Inn	W. H. Irwin	Hot Brass Pressing
West Michigan	Mar. 15	Dow Chemical Co.		Silicones—Ladies Night
Wichita	Mar. 16	K. of C. Hall	Hugo Barbian	Protective Treatments and General Shop Handling of Magnesium
Worcester	Mar. 10	Hickory House	W. R. Dornberger	Guided Missiles
York	Mar. 10	Lancaster, Pa.	H. E. Von Valkenberg	Ultrasonic Testing of Materials

Junior Members'

PLACEMENT SERVICE

Listed on the following pages are the qualifications of junior members of the American Society for Metals who are graduating (or who are candidates for advanced degrees) in the field of metallurgy. Most of these men will be available between now and next summer. They are grouped according to the school attended, on the pages indicated by the table of contents below. The name of the head of the department of metallurgy at the school, and in most instances, the name of the faculty member in charge of student placement, is indicated. Further information about any of these graduates may be secured from the head of the department or by writing to the student direct.

UNIVERSITY OF BRITISH COLUMBIA 19
Vancouver, B. C., Canada

F. A. Forward, Head, Department of Mining and Metallurgy; J. F. McLean, Director of Personnel Services

POLYTECHNIC INSTITUTE OF BROOKLYN 19
99 Livingston St., Brooklyn, N. Y.

Otto H. Henry, Head, Division of Metallurgical Engineering

CARNEGIE INSTITUTE OF TECHNOLOGY 19
Schenley Park, Pittsburgh 13, Pa.

Robert F. Mehl, Head of Department of Metallurgical Engineering; Charles E. Wangeman, Head of Bureau of Placements

CASE INSTITUTE OF TECHNOLOGY 20
10900 Euclid Ave., Cleveland 6, Ohio

K. H. Donaldson, Head, Department of Metallurgical Engineering; Arthur E. Bach, Manager, Placement and Personnel

UNIVERSITY OF CINCINNATI 21
Cincinnati 21, Ohio

William Licht, Professor and Acting Head, Department of Chemical and Metallurgical Engineering; Ralph A. Van Wye, Head of Student Placement

COLORADO SCHOOL OF MINES 22
Golden, Colo.

Clark B. Carpenter, Head of the Department of Metallurgical Engineering

COLUMBIA UNIVERSITY 21
New York 27, N. Y.

Maxwell Gensamer, Professor of Metallurgy; Samuel Beach, Director, Placement Bureau, Alumni House

CORNELL UNIVERSITY 22
Ithaca, N. Y.

F. H. Rhodes, Director, School of Chemical and Metallurgical Engineering, College of Engineering; J. L. Munchauer, Director of Placement Service

DREXEL INSTITUTE OF TECHNOLOGY 23
Philadelphia 4, Pa.

A. W. Grosvenor, Head of the Department of Metallurgical Engineering; Robert McMurray, Placement Officer

ECOLE POLYTECHNIQUE 24
Montreal, Quebec, Canada

GROVE CITY COLLEGE 24
Grove City, Pa.

R. Clark Dawes, Head of Department of Metallurgy; Jack Kennedy, Placement Director

UNIVERSITY OF ILLINOIS 24
College of Engineering, 211 Ceramics Bldg., Urbana, Ill.

H. L. Walker, Head of Department of Mining and Metallurgical Engineering

ILLINOIS INSTITUTE OF TECHNOLOGY 24
330 Federal St., Chicago 16, Ill.

Otto Zmeskal, Director of Department of Metallurgical Engineering; Earl C. Kubicek, Director of Placement

LAFAYETTE COLLEGE 23
Easton, Pa.

L. Donovan Clark, Head of the Department of Mining and Metallurgical Engineering; F. W. Slantz, Head of Placement Bureau

LEHIGH UNIVERSITY 25
Bethlehem, Pa.

Allison Butts, Head of Department of Metallurgical Engineering

McGILL UNIVERSITY 26
Montreal, Quebec, Canada

J. U. MacEwan, Chairman of the Department of Metallurgical Engineering; C. M. McDougall, McGill Placement Service, 3574 University St., Montreal

UNIVERSITY OF MICHIGAN 28
Ann Arbor, Mich.

Donald L. Katz, Chairman of Department of Chemical and Metallurgical Engineering

MICHIGAN COLLEGE OF MINING AND TECHNOLOGY 27
Houghton, Mich.

C. T. Eddy, Head, Department of Metallurgical Engineering; L. F. Duggan, In Charge of Student Placement

MICHIGAN STATE COLLEGE 26
East Lansing, Mich.

A. J. Smith, Head of the Department of Metallurgy; Tom King, Dean of Students and Director of Placement Service

UNIVERSITY OF MINNESOTA 29
Minneapolis 14, Minn.

R. L. Dowdell, Head of the Department of Metallurgy

MISSOURI SCHOOL OF MINES AND METALLURGY 28
Rolla, Mo.

A. W. Schlechten, Chairman of Department of Metallurgical Engineering; Donald L. Dean, In Charge of Student Placement

MOHAWK VALLEY TECHNICAL INSTITUTE 29
New Hartford, N. Y.

MONTANA SCHOOL OF MINES 29
Butte, Mont.

Frederick A. Hames, Department of Metallurgy;, A. E. Adami, Placement Director

NEW YORK UNIVERSITY 30
University Heights, New York 53, N. Y.

Harold K. Work, Director of Research Division

UNIVERSITY OF NOTRE DAME 29
South Bend, Ind.

E. A. Peretti, Head of Department of Metallurgy

OHIO STATE UNIVERSITY 31
100 Lord Hall, Columbus, Ohio

M. G. Fontana, Head of Department of Metallurgy; Miss Lilyan B. Bradshaw, Placement Director, College of Engineering

UNIVERSITY OF PENNSYLVANIA 32
Philadelphia 4, Pa.

R. M. Brick, Director of Department of Metallurgical Engineering; Graig Sweeten, Director of University Placement, 3400 Walnut St., Philadelphia 4, Pa.

PENNSYLVANIA STATE COLLEGE 31
School of Mineral Industries, State College, Pa.

Jay W. Frederickson, Chief, Division of Metallurgy; G. N. P. Leetch, Director of College Placement Service

PURDUE UNIVERSITY 32
Lafayette, Ind.

R. Schuhmann, Jr., Professor of Metallurgical Engineering, Chairman of the Division, School of Chemical and Metallurgical Engineering; F. L. Cason, Director, Placement Service, Engineering and Science

RENSSELAER POLYTECHNIC INSTITUTE 32
Troy, New York

Wendell F. Hess, Head of Department of Metallurgical Engineering; Herbert P. Catlin, Head of Student Placement

STANFORD UNIVERSITY 34
Stanford University, Calif.

O. Cutler Shepard, Director, Division of Mineral Technology; Eugene Dils, Director of Placement Service

STATE COLLEGE OF WASHINGTON 35
Pullman, Wash.

J. P. Spielman, Dean, School of Mines and Acting Head, Department of Metallurgy; Walter M. Bristol, Director of Placement Bureau

UNIVERSITY OF TENNESSEE 34
Knoxville, Tenn.

E. E. Stansbury, Professor of Metallurgical Engineering, Chemical Engineering Department; Howard H. Lumsden, Director of Bureau of Personnel Service

TEXAS WESTERN COLLEGE 34
University of Texas, El Paso, Tex.

A. N. Foster, Director of Placement and Extension

UNIVERSITY OF UTAH 34
205 Mines Bldg., Salt Lake City 1, Utah

John R. Lewis, Head, Department of Metallurgical Engineering

UNIVERSITY OF WASHINGTON 34
Seattle 5, Wash.

Drury A. Pifer, Director of School of Mineral Engineering; Edward A. Rowe, In Charge of Placement

WAYNE UNIVERSITY 35
Detroit 1, Mich.

James A. Taylor, Head of Department of Chemical and Metallurgical Engineering; Merland A. Kopka, Head of Graduate Placement

UNIVERSITY OF WISCONSIN 35
1509 University Ave., Madison 16, Wis.

G. J. Barker, Chairman, Department of Mining and Metallurgy

YALE UNIVERSITY 35
Hammond Metallurgical Laboratory, New Haven, Conn.

Arthur Phillips, Chairman, Department of Metallurgy

YOUNGSTOWN COLLEGE 35
Youngstown, Ohio

Edward J. Fisher, Head of Department of Metallurgical Engineering; Prof. Cooper, Head of Student Placement

University of British Columbia

J. G. Clement Simard

Degree Expected: B.A.Sc. in Met. Eng.

School Address: 1531 Davie St., Apt. 207, Vancouver 5, B. C.

Home Address: Same

Age 28. Married. C.O.T.C. commission R.C.E.(RF). Courses include ferrous and nonferrous metallurgy and metallography, thermodynamics, X-ray diffraction and research in color metallography. Speak and write French and English. Experience: 26 months active service as works officer R.C.E., 10 months with research and development at C.M. & S., Trail, working on lead sintering, zinc leaching and low-frequency induction melting. Wide experience in photography. Prefers industrial research and development in Eastern Canada.

Polytechnic Institute of Brooklyn

Asa Kaplan

Degree Expected: B. of Met. Eng.

School Address: 2401 63rd St., Brooklyn 4, N. Y.

Home Address: Same

Age 21. Single. U. S. Army Reserve (R.O.T.C.). Must serve two years in year or two. Required courses, ferrous and nonferrous metallurgy, physical chemistry, X-ray diffraction, etc. Powder metallurgy, metal properties at high temperatures, and advanced mathematics courses. Thesis on "Growing and Testing of Single Metal Crystals". Dean's List. Past V.P. of A.I.M.E. Laboratory assistant in metallurgical laboratory. Desires research in ferrous or nonferrous. Northeast U. S. preferred. Available June 17.

Neil Elliot Rogen

Degree Expected: B. of Met. Eng.

School Address: 201 Grafton St., Brooklyn, N. Y.

Home Address: 200 Galivan St., Greenville, S. C.

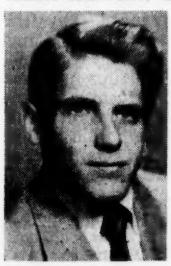
Age 21, single, classified 4F due to myopic condition which is corrected with glasses. Have been interested in production management and industrial relations courses. Thesis entitled "Powder Metallurgy of T a C and Ni". Was president and vice-president of school's A.S.M. chapter. Summer employment as junior engineer at a metallurgical testing and research company. Prefers production or development leading to management. Desires location near a university where he can work toward master's degree. Available June 15.

Robert G. Shepheard

Degree Expected: B. of Met. Eng.

School Address: 101-39 93rd St., Ozone Park 16, N. Y.

Home Address: Same



Age 21, single, draft status 4F. Courses taken include refractories, physical chemistry, thermodynamics, ferrous and nonferrous metallurgy and metallography, electrometallurgy, pyrometry, powder metallurgy, welding. Has worked part time as general laboratory assistant in school metallurgy laboratory. Thesis: "Continuous Annealing Characteristics of Brasses". Prefers practical research or development in nonferrous industry, New York area. Available March.

Vincent Paul Siuta

Degree Expected: B. of Met. Eng.

School Address: 139 Broadway, Elizabeth 1, N. J.

Home Address: Same

Age 21, single, student deferment until June 30, 1954. Courses include all prescribed metallurgical engineering subjects. Elected to Phi Lambda Upsilon. Has worked in metallurgy and materials testing laboratories. Interested in research. Available July.

Guy Torre

Degree Expected: B. of Met. Eng.

School Address: 85 Livingston St., Brooklyn, N. Y.

Home Address: 92 Kane St., Brooklyn 2, N. Y.

Age 21, single, draft status 2s. Studies include ferrous and nonferrous metallurgy and metallography, electrometallurgy, physical chemistry, welding and design, pyrometry, refractories, metallurgical thermodynamics, X-ray crystallography, spectroscopy, light metals and alloys, statistical analysis and industrial economics and management. Thesis: "Behavior of Solid Metal, Stressed and Unstressed, in Liquid Metal Surroundings". Vice-Chairman A.S.M. Student Chapter. Desires metals production work or industrial engineering of metallurgical processes. Location immaterial. Available June.

Carnegie Institute of Technology

Ronald C. Campbell

Degree Expected: B.S. in Met. Eng.

School Address: 1016 Fairdale St., Pittsburgh 4, Pa.

Home Address: Same

Age 21, single, draft status 2s. Courses include process, mechanical and physical metallurgy, ferrous and nonferrous metallography, seminar, thesis, and minors in electrical and mechanical engineering in addition to the basic sciences and humanistic and social studies. Extra courses in mathematics and advanced physical metallurgy. Limited experience in metallurgical laboratory of forgings company and in experimental foundry. Desires production or research and development. Any location. Available June.

Michael Evan

Degree Expected: B.S. in Met. Eng.

School Address: Carnegie Institute of Technology, Box 318, Pittsburgh 13, Pa.

Home Address: 638 Knox Ave., Monessen, Pa.

Age 32, single, veteran. Courses include physical and process metallurgy, principles of metallurgical operations, ferrous and nonferrous metallography, mechanical metallurgy, physical chemistry and thesis on "Powder Metallurgy". Metals Club, Newman Club, bowling (intramural). Experience includes machine shop work, radio maintenance (A.A.F.) foundry work, clerk in bessemer department, X-ray diffraction and quality control, research trainee (carbide-powder metal.) June graduate.

Carnegie Tech (Cont.)

Floyd S. Greenwood Jr.

Degree Expected: B.S. in Met.; B.A. in Liberal Arts

School Address: General Delivery, Carnegie Inst. of Tech., Pittsburgh, Pa.

Home Address: Mtd. Rd. 11, Beechwood Blvd., Ellwood City, Pa.

Age 22, single, draft status 1A. Courses include physical metallurgy, physical chemistry, ferrous and nonferrous metallography, mechanical metallurgy, seminar in metallurgical engineering, ferrous and nonferrous process metallurgy, and principles of metallurgical operations. Summer work in stainless steel foundry and seamless tube mill. Desires work in high-alloy ferrous alloys leading to position in management. Location preferably within 300 miles radius of Pittsburgh, but not essential. Available June 14.

Owen Marvin Katz

Degree Expected: B.S. in Met. Eng.

School Address: 1051 Morewood Ave., Pittsburgh 13, Pa.

Home Address: 4024 Fairfax Rd., Baltimore 16, Md.

Age 21, married, draft status 2S. Projects: Wet and dry oxidation studies of molybdenum, oxidation of oxygen-saturated titanium. Advanced physical metallurgy, advanced mathematics, advanced physics. Alumni and Crabtree scholarship. Varsity football (3 years), Steward of social fraternity. Experience: Steel mill—skin pass, galvanize inspector; mechanic's helper; metals research laboratory, Carnegie Tech. Interested in entire metallurgical field—physical metallurgy in research, development, production. Pittsburgh area preferred. Available July 1.

George P. Seitanakis

Degree Expected: B.S. in Met.

School Address: 5028 Morewood Place, Pittsburgh 13, Pa.

Home Address: 710 Spring St., Latrobe, Pa.

Age 21, single, 2-S classification until June 10, 1954. Majored in metallurgical engineering. Vice-president-treas. of departmental metals club.; Sigma Alpha Epsilon. Summer work in metallurgy laboratory. Prefers metallurgical development work in Pittsburgh district but will consider others. Available middle of June.

Fitz R. Winslow

Degree Expected: B.S. in Met. Eng.

School Address: 210 Stratford Ave., Pittsburgh 6, Pa.

Home Address: Same

Age 23, married. 1-A draft status. Two years Massachusetts Institute of Technology. Courses include physical, process and mechanical metallurgy, advanced physical metallurgy, ferrous and nonferrous metallography, personnel administration, seminar and thesis. Tau Beta Pi. Three years experience in large physical metallurgy laboratory with special experience in oxidation, diffusion and creep. Q clearance for secret work. Desires research or development only, specializing in physical metallurgy, in government or industrial laboratory. No territory preference. Available June.

Case Institute of Technology

Robert William Bohn

Degree Expected: B. S. in Met.

School Address: 11318 Bellflower Rd., Cleveland, Ohio

Home Address: 1864 E. 82nd St., Cleveland, Ohio

Age 21, married, no children, 2S draft status. Wants ferrous work. Courses include production and development, ferrous foundry, production metallurgy, advanced physical metallurgy. Summer work as millwright helper. Anywhere in U.S.A. Available July 1.

Joseph M. Fackelmann

Degree Expected: B.S. in Met. Eng.

School Address: 3398 W. 126 St., Cleveland, Ohio

Home Address: Same

Age 22, single; 4-F draft status. Courses include advanced physical metallurgy, physical chemistry, advanced ferrous metallurgy, production metallurgy, metals forming and atomic physics plus required metallurgical courses. Summer work in metallurgical research laboratory of Cleveland Twist Drill Co., foundry of Ford Motor Co. Prefers Midwest location. Available June.

Andrew Magnusson

Degree Expected: B.S. in Met. Eng.

School Address: 3323 Maynard Rd., Cleveland 22, Ohio

Home Address: Same

Age 26, single. Prescribed metallurgy subjects. Elective: Prod. eng., electrometallurgy, foundry option, metal forming and adv. phys. met. Total of 3½ years plant experience in electrosteel, steel foundry, hot rolling mill, cold strip finishing mill, malleable iron foundry and gray iron. Preferred: Ferrous prod. manufacture or research. Location not essential. Available June 1954.

Milton W. Toaz

Degree Expected: B.S. in Met. Eng.

School Address: 142 Wandle Ave., Bedford, Ohio

Home Address: Same

Age 23, single, draft status 2S. Courses include: physical chemistry and metallurgy, advanced physical and ferrous metallurgy, ferrous and nonferrous foundry, foundry technology, ferrous and nonferrous production metallurgy, metal forming, electrometallurgy, industrial organization, psychology, personnel administration. Experience includes two summers in machine shop and part-time work at Case in research. Intends to pursue graduate studies in physical metallurgy. Prefers work in research and development. Available June.

Case Tech (Cont.)

Donald E. White

Degree Expected: B.S. in Met. Eng.

School Address: 14100 Superior Rd., Cleveland, Ohio
Home Address: Same

Age 27, married, one child, veteran, Naval Reserve officer. Graduate of U. S. Merchant Marine Academy, Kings Point, N. Y. with marine engineers license. Courses at Case include all prescribed metallurgical subjects plus atomic physics and metal forming. Worked through college as laboratory assistant at school and in industry. Prefers research in physical metallurgy with opportunity for graduate study. Midwest. Available July 1.

Martin L. Potter

Degree Expected: Met. Eng.

School Address: 173 Warner Ave., Cincinnati 19, Ohio
Home Address: 312 23rd St. N.W., Massillon, Ohio

Age 24, married, one child, draft status 3A. Courses include engineering thermodynamics, physical chemistry and physical metallurgy, metallography of cast metals, foundry technology, metallurgical operations, process metallurgy, etc. Three years experience in steel industry, one year in metallurgy laboratory handling failures and customer complaints regarding stainless steel. Prefers West Coast or Central area. Available July 1.

University of Cincinnati

Earl F. Adkins

Degree Expected: Met. Eng.

School Address: 520 Howell Ave., Cincinnati 20, Ohio
Home Address: 544 Telford Ave., Dayton 9, Ohio

Age 23, married, Army Reserve officer. Courses include physical chemistry, extraction, physical, ferrous and nonferrous metallurgy, electroplating, corrosion, failures analysis, heat treating, cast metals, machining, electrical engineering, strength of materials. Co-operative work experience includes physical and metallurgical testing, powder metallurgy, heat treating, failures analysis. Graduation in June.

Walter Ritter

Degree Expected: Met. Eng.

School Address: 1110 Woodlawn Ave., Cincinnati 5, Ohio
Home Address: Same

Age 22, single, draft status 1-D. (A.F.R.O.T.C.) Courses include general metallurgy, extraction metallurgy, electroplating, metallurgy operations, surface reactions, physical metallurgy, failure analysis. Member A.I.Ch.E., and Alpha Chi Sigma. Co-operative work in research and development department of International Nickel Co. and Buckeye Foundry. Prefers work in sales or design and development. No location preference. Graduate in June. Date available depends on U. S. Air Force.

James J. Donze

Degree Expected: Met. Eng.

School Address: 3322 Jefferson Ave., Cincinnati 20, Ohio
Home Address: 1160 Manor Ave. S.W., Canton 10, Ohio

Age 24, single, ROTC. Courses include economics, marketing, thermodynamics, physical chemistry and metallurgy, electrical engineering fundamentals, metallography, heat treating, electrometallurgy, corrosion and failure analysis. Fraternity and social activities. Three years co-operative experience as assistant in metallurgical research laboratory. Prefers technical sales or customer service. South or Southwest desired but not essential. Available from July until called to service.

Robert E. Via

Degree Expected: Met. Eng.

School Address: 2707 Clifton Ave., Cincinnati 20, Ohio
Home Address: 2140 Ravenwood Ave., Dayton 6, Ohio

Age 23, single, ROTC (Ordnance). Courses include regularly prescribed courses leading to degree plus foundry options, metallography of cast metals, foundry technology and foundry technology laboratory. Has had 4½ years co-operative experience in production gray iron foundry, in aluminum foundry and malleable iron foundry. Desires producing industry with ferrous metals. Prefers Midwest but not essential. Available Aug. 1.

Lynn D. McDougall

Degree Expected: Met. Eng.

School Address: 520 Howell Ave., Cincinnati 20, Ohio
Home Address: R.D. #4 Grove City, Pa.

Age 22, single, 2S draft status. Courses include physical metallurgy, foundry metallography, ferrous and nonferrous production metallurgy, electrometallurgy, corrosion, electricity, physical chemistry, thermodynamics. Social and professional fraternities. Three years shop experience, mostly gray iron foundry. Prefers producing industry or metallurgical sales. No location preference. Available June 1.

Columbia University

Marvin L. Kohn

Degree Expected: B.S. in Met. Eng.

School Address: 915 Bergenline Ave., Union City, N. J.
Home Address: Same

Age 23, single, 1-A draft status. Courses included ferrous, nonferrous and physical metallurgy, metallography, extractive and mechanical metallurgy, elementary crystallography and an introductory course in theoretical physical metallurgy. Employed summer and part-time during academic year as laboratory assistant in large heat treating company. Prefers either nonferrous or corrosion resistant steel research and development. N.Y.C. and vicinity preferred but not necessary. Available June 15.

Colorado School of Mines

Frederick H. Campbell

Degree Expected: B. S. in Met.

School Address: Sigma Nu House, Golden, Colo.
Home Address: 3558 Stoer Rd., Shaker Heights, Ohio

Age 22, single, member of R.O.T.C. Courses include physical and quantitative chemistry, thermodynamics, ore dressing, iron and steel, nonferrous metallurgy, mill design, physical metallurgy, spectrographic analysis, hydrometallurgy, pyrometallurgy, nonmetallic metallurgy, kinematics, strength of materials, fluid mechanics, surveying, ore microscopy and thermodynamics. Member of Sigma Gamma Epsilon and Blue Key Honorary. 2.1 or "B+" average. Available Aug. 20. Prefers ferrous industry in West.

John J. Kissell

Degree Expected: Met. Eng.

School Address: 9 Prospector Park, Golden, Colo.
Home Address: 22-30 75th St., Jackson Heights, N. Y.

Age 32, married, reserve officer USMC. Courses include ferrous and nonferrous production metallurgy, spectroscopy, physical metallurgy, physical chemistry, mineral dressing, thermodynamics, industrial mineral processing, kinematics and machine design, hydrometallurgy and electrometallurgy, reinforced concrete design. Attended Manhattan College for three years before war. Worked four years as draftsman on design of metallurgical plants, and three years part-time drafting at C.S.M. Research Foundation. Desires plant design work in New York Metropolitan area. Available June 2.

Robert E. Mihalco

Degree Expected: Met. Eng.

School Address: 18 Prospector Park, Golden, Colo.
Home Address: 735 Moffat St., Pueblo, Colo.

Age 25, married, veteran, draft status 4A. Studies include ferrous and nonferrous production, mineral dressing, hydrometallurgy, electrometallurgy, metallography, X-ray diffraction, phase equilibrium, economics and industrial relations. United States Vanadium Co.'s senior year technical scholarship. Fraternity and professional society member. Work experience in steel plant as roll hand in a 10-in. rolling mill and rail mill. Work in production or fabrication preferred. West Coast preferred, but not essential. Available June 15, 1954.

Roger H. Todd

Degree Expected: Met. Eng.

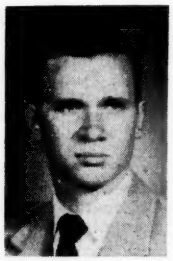
School Address: 13 Prospector Park, Golden, Colo.
Home Address: 3701 Estes St., Wheat Ridge, Colo.

Age 26, married, one child, veteran, now in organized Naval air reserve. Courses include physical chemistry, iron and steel, nonferrous metallurgy, mineral dressing, hydrometallurgy, corrosion, thermodynamics, metallography, spectrography, electrical engineering, economics, machine design, industrial relations and special problem in uranium ore dressing. Honor roll in Junior year. Desires work in ore dressing or hydrometallurgical plant in Western U. S. Available June 1.

Stewart W. Towle

Degree Expected: Met. Eng.

School Address: S.P.E. House, Golden, Colo.
Home Address: Box 282, Benson, Ariz.

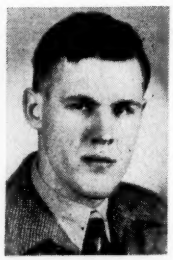


Age 21, single, R.O.T.C. graduate. May have up to year to work before entering the service for two years. Courses include metallography, spectroscopy, physical chemistry, hydrometallurgy, iron and steel, nonferrous metallurgy. Student member A.I.M.E. Prefers producing industry or research with nonferrous metals. No preference to location. Available late summer.

Leonard J. Trenkenschuh

Degree Expected: Met. Eng.

School Address: 1520 Maple St., Golden, Colo.
Home Address: 525 Alma Ave., Pueblo, Colo.



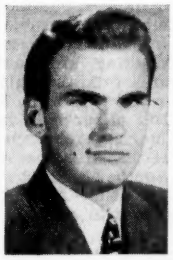
Age 24, single, draft status 2-S. Courses of major study include general metallurgy, ferrous and nonferrous metallurgy, assaying, mineral dressing and flotation, physical chemistry, hydrometallurgy, thermodynamics, spectroscopy, metallography, X-ray diffraction and physical metallurgy. Experience: three years nonskilled work in Colorado steel plant. Prefers work in strategic mineral industry such as the vanadium and uranium industry in the Western United States. Available June 1, 1954.

Cornell University

Otto P. Eberlein

Degree Expected: B. Met. Eng.

School Address: Cooper Apt. #1, 120 German Cross Rd., Ithaca, N. Y.
Home Address: 14919 Arden Ave., Lakewood 7, Ohio



Age 22, Reserve status, ensign, U.S. N.R., will serve 3 years immediately after graduation. Physical metallurgy and foundry electives. In 1953 was first prize co-winner in A. F. Davis undergrad welding contest and third prize winner in Lincoln arc welding contest. Editor and writer for yearbook and Cornell Alumni News. Sports. Honorary fraternities. Two years as research associate, A.F.S., and five summers as foundry trainee and inspector. Desires development or sales in foundry or forge shop, Cleveland or Chicago. Available 1957.

A. David Rossin

Degree Expected: B. Eng. Phys.

School Address: 408 Eddy St., Ithaca, N. Y.
Home Address: 3802 Washington Blvd., Cleveland 18, Ohio

Age 22, single, draft status 1A. Background includes 26 hr. of mathematics, 36 hr. in physics, minors in materials and electronics. Additional technical elective work in metallography, X-rays, nonferrous metals, and nuclear reactor technology. Project relates to construction of operating electromagnetic liquid metal pump. Experience growing single metal crystals for research company. Interest—applications of materials in nuclear power engineering. Any location. Available June 20.

Drexel Institute of Technology

Francis J. Dragun

Degree Expected: B.S. in Met. Eng.

School Address: 2536 E. Edgemont St., Philadelphia 25.
Home Address: Same

Age 27, married, one child, veteran. Courses include physical, process and foundry metallurgy, physical chemistry, thermodynamics, heat transfer, welding, corrosion and heat resistance of alloys, strength of materials, electrical engineering. Work experience as engineering assistant includes 11 months in mechanical testing division, and 12 months in thermal metallurgy division of research and development laboratory. Prefers work in development or production. Available July.

William J. Durako

Degree Expected: B.S. in Met. Eng.

School Address: 3010 S. 17th Street, Philadelphia 45, Pa.
Home Address: Same

Age 22, single, draft status 2-S. Courses include physical metallurgy, mechanical metallurgy, foundry metallurgy, corrosion, welding and radiography, heat transfer and physical chemistry. Fraternity, Varsity Club and technical society. Experience includes one year in research and development, six months in a nonferrous foundry and six months in the chemical division of paper industry. Desires work in production or sales with opportunity to advance into management. No geographical preference. Available June.

Donald R. Haines

Degree Expected: B.S. in Met. Eng.

School Address: 206 N. Adams St., West Chester, Pa.
Home Address: Same

Age 27, married, veteran, nonreserve. Courses include physical metallurgy, process metallurgy with emphasis on thermodynamics and kinetics, foundry, welding, corrosion, radiography, atomic physics, personnel administration, and labor relations. Chairman of local student chapter of A.S.M. Experience in physical testing of cold drawn stainless steel and as technical assistant in metallurgical lab of basic openhearth steel foundry. Desires ferrous foundry production in East. Available June 14.

A. Richard Henricks

Degree Expected: B.S. in Met. Eng.

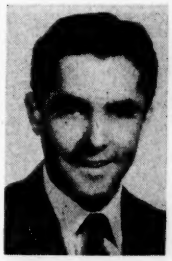
School Address: 200 Hillside Ave., Jenkintown, Pa.
Home Address: Same

Age 23, single, draft status 2-S. Courses include all subjects prescribed for degree in metallurgical engineering. Extra-curricular activities include recording secretary of A.S.M. group at Drexel, corresponding secretary of social fraternity two years, and honorary music fraternity. Experience: development work in small arms ammunition; engineering aide in welding research laboratory; metallurgical observer in steel plant. Interested in development or production work. East preferred. Available June 21.

Arnold H. Holtzman

Degree Expected: B.S. in Met. Eng.

School Address: 5657 Arlington St., Philadelphia 31, Pa.
Home Address: Same



Age 22, single, draft status 2-S. Courses include physical chemistry and metallurgy, process metallurgy, thermodynamics, applied spectroscopy, atomic physics. Member of Tau Beta Pi, honorary engineering society. Two years experience in cold working of austenitic and ferritic stainless steels. Desires research or development. No location preference. Considering graduate work in physics and metallurgy.

Peter J. Koros

Degree Expected: B.S. in Met. Eng.

School Address: 2936 Clinton St., Camden 5, N. J.
Home Address: Same

Age 22, single, draft status 2S. Fluent Spanish. Subjects include physical, process and mechanical metallurgy, foundry, corrosion, heat transfer, welding, physical chemistry, machine design, AC-machinery, labor relations, business law, engineering economics. Activities: A.I.M.E.; officer, Tau Beta Pi; committee chairman, A.S.M. Philadelphia Junior Section. Cooperative industrial experience: 22 months in heat treating shop, wire mill, quality control in steel mill. Prefers production or development. Available June.

Lafayette College

Carl Robert Beidleman

Degree Expected: B.S. in Met. Eng.

School Address: Sigma Chi House, Lafayette College, Easton, Pa.
Home Address: 100 Wyoming St., Wilkes-Barre, Pa.

Age 21, single, draft status 2-S. Typical metallurgy courses with an excess of arts electives. Desires to get into technical business and management. Worked summers in laboratories. Member of Tau Beta Pi (president), Pi Delta Epsilon, Knights of the Round Table, Senior Court, Vice-president of Sigma Chi and secretary of the John Markle Society which is affiliated with the A.I.M.E. No location preference. Available June 15.

John A. Ferrante

Degree Expected: B. S. in Met. Eng.

School Address: Theta Xi, Lafayette College, Easton, Pa.
Home Address: 19450 McCracken Rd., Cleveland, Ohio.

Age 21, single, draft status 2-S. Courses include physical metallurgy, light metals, powder metallurgy, iron and steel production, advanced physical metallurgy and foundry. Has worked two summers in heat treatment of steel parts. Would be interested in job in South America. No preference as to type of metal industry, but would like to be in production.

***FOR FURTHER INFORMATION about these graduates** Write direct to student or to head of metallurgy department or placement bureau at the school. See list on pages 17 and 18.*

Ecole Polytechnique

Jacques E. Marleau

Degree Expected: B.A.Sc.

School Address: 4122 Northcliffe Ave., Montreal 28, P. Q.
Home Address: Same

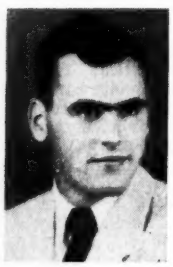
Age 23, single, lieutenant in army reserve (3rd Fd. Engr. Rgt. CA (RF). Montreal). Attended College Sainte-Marie, Montreal, and received BA cum laude. Courses followed both in chemical and metallurgical engineering. Worked two summers as technical assistant in a big chemical concern. Prefers producing industry or industrial work in nonferrous metals. No territory preference. Available April 26.

Grove City College

William R. Kerr

Degree Expected: B.S.

School Address: 431 South Broad St., Grove City, Pa.
Home Address: 2819 Reed St., Erie, Pa.



Age 22, married, 1-A draft status. Courses include general, ferrous and physical metallurgy, metallurgical calculations, general metallography, heat treatment of steels, metallography of iron and steel, physical chemistry, quantitative analysis, thermodynamics and strength of materials. Summer experience as laborer on heavy construction jobs and carpenter's helper in furniture factory. Prefers producing industry with ferrous metals. Eastern territory desired but not essential. Available June 14.

William F. Klenk, Jr.

Degree Expected: B.S.

School Address: Box 118, Grove City College, Grove City, Pa.
Home Address: 261 Morris St., Phoenixville, Pa.

Age 21, single, advance Air Force R.O.T.C. student—when called to active duty it will be as a metallurgist. Courses include introduction to metallurgy, metallurgical calculations, ferrous metallurgy, physical metallurgy, metallography, heat treatment, strength of materials, thermodynamics, physical chemistry, labor problems and industrial management. Summer work as a roofer and press operator in laminated plastics company. No preference to type of work. Desired location: Pennsylvania. Available June 7.

Frederick Wellman

Degree Expected: B.S. in Mech. Eng.

School Address: 627 Liberty St., Grove City, Pa.
Home Address: R.D. #4 New Castle, Pa.

Age 27, married, two children, veteran World War II, 5-A draft status. Courses include strength of materials, steam power engineering, refrigeration-air conditioning, phase diagrams, ferrous and physical metallurgy, metallography, A.C. and D.C. machinery, A.C. and D.C. currents. Experience in rolling mill, carpentry and painting. Desires producing industry. East or Midwest preferred. Available June 15.

University of Illinois

Dee Lyle Lightbody

Degree Expected: B.S. in Met. Eng.

School Address: 410 S. Busey, Urbana, Ill.
Home Address: Glasford, Ill.

Age 21, single, 2S draft status. Courses include physical metallurgy, thermodynamics, phase diagrams, electrometallurgy, engineering law, ferrous and nonferrous production metallurgy, ferrous and nonferrous metallography, heat treatment, physics of metals, metallurgical calculations. Member of scholastic honorary, Phi Eta Sigma. Summer work as laborer on construction jobs. Prefers industrial or producing industry, nonferrous in Midwest. Available June 22.

Roy R. Ross

Degree Expected: B.S. in Met. Eng.

School Address: 1011 W. Springfield, Urbana, Ill.
Home Address: 816 Pine St., Waukegan, Ill.

Age 25, married, draft status 1C-reserve. Courses include physical metallurgy, ferrous metallurgy and metallography, nonferrous metallurgy and metallography, ferrous production metallurgy, nonferrous production metallurgy, metallurgical calculations, deep drawing and pressing, alloy steels and powder metallurgy. Prefers industrial work in light metals industry. Any location. Available June 14.

Richard V. Turley

Degree Expected: B.S. in Met. Eng.

School Address: 907 South Sixth, Champaign, Ill.
Home Address: South Walnut St., Rochester, Ill.

Age 22, single, 2S status. Courses include physical chemistry, metallurgical calculations, physics of metals, advanced materials testing, metallography and prescribed metallurgy subjects. Attended Springfield Junior College, graduated with honors. Belongs to Phi Theta Kappa honor fraternity. Summer work as process observer in openhearths. Desires production or production planning in nonferrous metals. No location preference. Available July 1.

Illinois Institute of Technology

Carl J. Altstetter

Degree Expected: M.S. in Met. Eng.

School Address: 907 South Sixth, Champaign, Ill.
Home Address: 1466 West Market St., Lima, Ohio

Age 23, married, draft status 2S. Advanced courses include steel transformations, chemical thermodynamics, deformation of metals, X-rays, crystallization of metals and physics. Three years co-operative experience in production and development metallurgical laboratory, including work on ferrous, nonferrous and nonmetallic materials. Prefers research or development work in or near a large city—no sectional preference. Available mid-June.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school.* *See list on pages 17 and 18.*

Illinois Tech (Cont.)

Stanley F. Sternasty

Degree Expected: M.S. in Met. Eng.

School Address: 3451 W. 54 St., Chicago 32, Ill.
Home Address: Same

Age 21, single, 2S until June. Courses include metallurgical engineering operations and processes, structure of metals, foundry courses and business and economics. Foundry Educational Foundation scholarship. Worked summers in foundry and fabrication plant. One year part-time in product development. One year part-time in research in powder metallurgy. Prefers production or development in ferrous or nonferrous industry. No location preference. Available July.

Richard K. Sutz

Degree Expected: B. S. in Met.

School Address: 8011 South Throop, Chicago 20, Ill.
Home Address: Same

Age 22, single, 2S until June. Standard plus foundry courses. Tau Beta Pi, Foundry Educational Foundation scholarship. Worked at Armour Research Foundation as lab. technician, associated with titanium development. Worked at Tech building research equipment and installing and repairing furnaces, controllers, etc. Machine shop and welding experience. Prefers work in research or development and design, in new metals field. No territory preference.

John A. Ytterhus

Degree Expected: M.S. in Met. Eng.

School Address: 2148 No. Central Park Ave., Chicago 47.
Home Address: Same

Age 20, single, 2-S status. Holds B.S. in Met. Eng. Courses include physical metallurgy and chemistry, metallurgical problems, steel transformations and prescribed courses. Management option, including courses in personnel administration, engineering economy and accounting. Employed by school in powder aluminum research. Desires research or development in nonferrous metals. Prefers foreign or far west. Available February 1955.

Lehigh University

Carl O. Bruning, Jr.

Degree Expected: B.S. in Met. Eng.

School Address: Theta Kappa Phi, 724 Delaware Ave., Bethlehem, Pa.
Home Address: 29 Hazel Drive, Pittsburgh 28, Pa.

Age 21, single, class ranking is first fifth. Courses include ferrous metallurgy, nonferrous and physical metallurgy, metallography and metallurgical practice involving actual practice at solving problems at local steel plant. Laboratory assistant during summers. Desires sales engineering or production metallurgy. No location preference. Classification 1-D. Available July 1.

Joseph J. Eisenhauer

Degree Expected: B.S. in Met. Eng.

School Address: 724 Delaware Ave. Bethlehem, Pa.
Home Address: 725 Guilford St., Lebanon, Pa.

Age 22, single, 2-S draft status. Courses include physical chemistry, physical metallurgy, metallography, ferrous and nonferrous metallurgy, industrial metallurgy, metallurgical practice (a nine-credit hour course given in conjunction with a local steel company), labor problems, business law and corporation finance. Fourth in class of 280. Three summers of industrial metallurgical employment. Prefers plant development or production, nonferrous metals in east or midwest. Available June 28.

Roy F. Hyde

Degree Expected: B.S. in Met. Eng.

School Address: 230 West Packer Ave., Bethlehem, Pa.
Home Address: 515 Bridlemere Ave., Interlaken, N. J.

Age 21, single, draft status 2-S. Courses include physical metallurgy, metallography, advanced iron and steel, industrial and nonferrous metallurgy, electrometallurgy, physical chemistry. Summer work in merchant mills of steel company. Member Lehigh Metallurgical Society. Intramural sports. Desires customer contact work in ferrous or nonferrous. No preference in location. Available July 1.

James Stephen Kesperis

Degree Expected: B.S. in Met. Eng.

School Address: 501 Ontario St., Bethlehem, Pa.
Home Address: Same

Age 22, single, draft status 2S. Courses include physical metallurgy, physical chemistry, thermodynamics, electrochemistry and electrometallurgy, advanced iron and steel, nonferrous metallurgy, and X-ray and radiation methods. Desires production or research and development work. Available in February 1954.

Richard J. Quigg

Degree Expected: M.S. in Met. Eng.

School Address: Dept. of Metallurgy, Lehigh University, Bethlehem, Pa.
Home Address: 1916 Kenmore Ave., Bethlehem, Pa.

Age 23, single, draft status 4F. B.S. from Virginia Polytechnic Institute (1952). M.S. thesis "Magnetic Materials From Nonferromagnetic Constituents". Courses include advanced physical metallurgy, alloy steels, quality control, others. Extracurricular activities (V.P.I.) include tennis, honor courts, others. Member Omicron Delta Kappa, Tau Beta Pi. Eight months experience with DuPont on titanium metal production, employed as research assistant during graduate work. Prefer development. Any location in U. S. Available June. June.

Lehigh (Cont.)

Edward W. Stewart

Degree Expected: M.S. in Met. Eng.

School Address: 224 Warren Square, Bethlehem, Pa.
Home Address: Street, Md.

Age 22. Single, 2-S draft status. B.S. in chemistry and physics from Washington College. Courses include surface treatment of metals, advanced physical metallurgy, physical chemistry, theory of solids, radiation methods. Two years experience as graduate research assistant on fine-particle permanent magnets for Navy contract. Three months experience as GS-4 chemist, security clearance. Prefers development and/or research. No preference as to location. Available June 15.

William Lee Tiley

Degree Expected: B.S. in Met. Eng.

School Address: 217 W. Packer Ave., Bethlehem, Pa.
Home Address: 627 Greenwood Ave., Pottsville, Pa.

Age 22, single, R.O.T.C. cadet, expects commission upon graduation. Usual metallurgical engineering subjects. Active in sports. Prefers work in sales or production. No preference as to location. Available June.

Edward R. Wyczalek

Degree Expected: B.S. in Met. Eng.

School Address: 516 Brodhead Ave., Bethlehem, Pa.
Home Address: 878 Sanford Ave., Irvington 11, N. J.

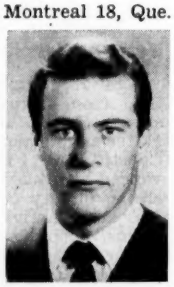
Age 20, single, 2S draft status. Courses include physical chemistry, physical metallurgy, metallography, electrochemistry and metallurgy, ferrous and nonferrous metallurgical production, advanced iron and steel treatment, industrial metallurgy and metallurgical investigations, prescribed engineering courses. Experience in research and production. Prefers development or application of metallurgy. New Jersey or Los Angeles preferred. Available June 21.

McGill University

Alexander G. Balogh

Degree Expected: B. of Met. Eng.

School Address: 3960 Henri Julien St., Montreal 18, Que.
Home Address: Same

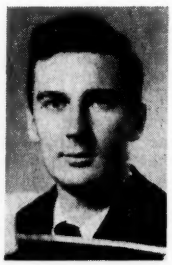


Age 21, single, Canadian by birth. Courses constitute a very thorough training in the theoretical and practical aspects of physical and extractive metallurgy. Was active in all phases of campus life in executive capacity. Worked as third helper on openhearth and in quality control department of aluminum plant. Prefer sales or production. No territory preference. Interested in foreign service. Available July.

Bruce M. Taylor

Degree Expected: B. of Met. Eng.

School Address: 7471 St. Denis St., Montreal, Que.
Home Address: Same



Age 24, single. Courses include physical and extractive metallurgy, mineral dressing, electrometallurgy, electrical engineering and thermodynamics. Summer experience as electrical draftsman, corrosion in oil refinery, metallography laboratory and openhearth metallurgy. Free to travel anywhere. Available June.

Michigan State College

James L. Buchanan

Degree Expected: B.S. in Met. Eng.

School Address: 729 E. Grand River, East Lansing, Mich.
Home Address: 940 Henrietta, Birmingham, Mich.

Age 21, single, draft status 1D, R.O.T.C., requires two years active duty. Courses include regularly prescribed subjects leading to degree. M.S.C. Alumni Scholarship. Social fraternity, technical societies, campus activities. No experience. Desires sales engineering with opportunity for administration. Midwest or California preferred. Available June.

Kenneth L. Herrick

Degree Expected: B.S. in Met. Eng.

School Address: 2780 E. Grand River, E. Lansing, Mich.
Home Address: N-1155 Jefferson Lane, Fenton, Mich.

Age 22, married, R.O.T.C. student with active duty to follow graduation within one year. Courses include physical metallurgy, metal chemistry and physics, foundry, forging, welding, rolling, heat treatment, measurements, calculations, physical chemistry and theoretical metallurgy. Tau Beta Phi candidate. Worked two summers for Chevrolet and one summer for SKS Heat Treating Co., Flint, Mich. Prefers producing industry, foundry or production physical metallurgy. Midwest preferred. Available June.

James Floyd Masterson

Degree Expected: B.S. in Met. Eng.

School Address: 336 North Clemens Ave., Lansing, Mich.
Home Address: Same

Age 22, married, ineligible for military service. Courses include ferrous and nonferrous metallurgy, physical metallurgy, physical chemistry, electrometallurgy, foundry metallurgy, materials testing, chemical analysis, machine design and advanced physical metallurgy. Summer experience in metallurgical laboratory of national corporation. Desires work in production metallurgy. Midwest or eastern location preferred. Available June 7.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school. See list on pages 17 and 18.*

Michigan State (Cont.)

Gene R. Rundell

Degree Expected: M.S. in Met. Eng.

School Address: 410 W. Shaw Hall, East Lansing, Mich.
Home Address: 1221 N. Ball St., Owosso, Mich.

Age 25, single, veteran, 4-A draft status. Courses include: Physical chemistry, physical metallurgy, foundry metallurgy. Thesis: "Factors Affecting the Chilling Tendency of Gray Iron". Pi Tau Sigma, recipient of Foundry Educational Foundation scholarship. Desires work in development or applied research in the foundry industry, east or midwest. Available June.

Roger E. Schwer

Degree Expected: B. of Met. Eng.

School Address: 128 Haslett St., East Lansing, Mich.
Home Address: 14800 Westwood, Detroit 23, Mich.

Age 21, single, Air Force R.O.T.C., draft status 1-D. Courses include physical metallurgy, metallography, physical testing, foundry metallurgy, thermodynamics, heat transfer and fluid flow. Alumni tuition scholarship. Member and officer social fraternity. Summer experience in physical testing laboratory. Part-time experience in metallographic and heat treating laboratory. Prefers sales or production work. Detroit or Midwest preferred. Available June 20.

Ronald G. Kellokoski

Degree Expected: B.S. in Met. Eng.

School Address: 1538 Hecla St., Calumet, Mich.
Home Address: Same

Age 21, single, draft status 2-S until June 10. Courses include protective coatings, pyrometry, metallography and physical chemistry. Awarded 4-year scholarship. College honors. Honorary fraternity. "Who's Who Among Students in American Colleges and Universities". Worked summers in nonferrous smelting and refining. Desires producing industry, ferrous or nonferrous. No location preference. Available May 30.

Arbutus E. Nakkula

Degree Expected: B.S.

School Address: RTE #1, Atlantic Mine, Mich.
Home Address: Same

Age 20, single. Studied physical metallurgy, principles of metallurgy, process metallurgy, protective coatings, X-rays, metallography, foundry. Michigan High School and Geo. B. Robbe Scholarships. Summer work as metallographer, Wyman-Gordon Drop Forge Corp., Worcester, Mass. Prefers X-ray, metallography or sales work. No location preference. Available in June.

Michigan College of Mining and Technology

Duane H. Feisel

Degree Expected: B.S. in Met. Eng.

School Address: 522 Sheldon, Apt. 30, Houghton, Mich.
Home Address: 14901 Lamphere Ave., Detroit 23, Mich.

Age 21, single, draft status 2S. Courses include metal transition analysis, advanced metallurgical thermodynamics, heat treating, foundry, alloy steels, ferrous and nonferrous physical metallurgy, accounting, business law, atomic and nuclear chemistry. College, G.E. W.A.A.I.M.E. and Detroit Society of Engineers' Wives scholarships. President of student council and blue key fraternity. Desires sales, research or development work. Available June.

Geraldine Asher Hartley (Mrs.)

Degree Expected: B.S. in Met. Eng.

School Address: 330 Miller Rd., Houghton, Mich.
Home Address: 816 Grant Ave., Eveleth, Minn.

Age 22, married. Courses include physical metallurgy, ferrous and nonferrous production metallurgy, metallurgical seminar, electrometallurgy, scientific German, quantitative analysis, European history, economics. Received Women's Badge of Tau Beta Pi; elected to "Who's Who Among Students". Secretarial background and experience. Prefer work in research, industrial contacts. Desire Michigan, Wisconsin, Minnesota location. Available July 1.

Floryan B. Wercinski

Degree Expected: B.S. in Met. Eng.

School Address: 1019 E. Houghton Ave., Houghton, Mich.
Home Address: Box 313, Stambaugh, Mich.

Age 23, single, draft status 2-S. Courses include pyrometry-instrumentation-control, electrometallurgy applications, physical metallurgy, metallography, ferrous, nonferrous metals (five terms), refractories, foundry alloy steels, furnace design-construction-control, applied heat treatment, physical chemistry, thermodynamics, labor relations. Activities mainly in part-time work. Three summers and one year iron mining, five months as part time engineer's helper, Durametallic Corp., Kalamazoo, Mich. Desires light metal production. Midwest preferred, but not essential. Available May 23.

John A. Van Westenburg

Degree Expected: M.S. in Met. Eng.

School Address: 405 Lovell Rd., Woodmar, Houghton, Mich.
Home Address: Same

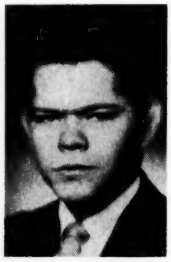
Age 22, married, two children, draft status 3A. B.S. in Met. Eng. (M.C.M.T.). Electives include X-ray analysis, protective coatings (electroplating, porcelain enameling, etc.), thermodynamics, radio isotope techniques, engineering administration courses. Thesis subject: "Gaseous Reduction of Iron Ore". Member Tau Beta Pi. Highest ranking in 1953 graduating class. Two summer's employment in forging industry. West or Midwest preferred. Available June 7.

University of Michigan

Hubert B. Probst

Degree Expected: M.S. in Met.

School Address: 802 S. Main St., Ann Arbor, Mich.
Home Address: 1111 Iowa St., Louisiana, Mo.



Age 23, single, 2-S draft status. B.S. in metallurgy from university of Notre Dame. Course work principally in physical metallurgy; ferrous and nonferrous. Graduate research on austenitic grain growth and autoradiographic study of diffusion in the iron-nickel system. Three summers experience in foundry and metallurgical laboratory. Desires research. Midwestern location preferred. Available June 30.

Alfred S. Keh

Degree Expected: D.Sc. in Met. Eng.

School Address: 533 Church, Ann Arbor, Mich.
Home Address: 58 Granville Rd., Kowloon, Hongkong

Age 27, single. Applying for 1st papers. Holding B.Sc. in Mech. Eng., M.S.E. in Industrial Eng. Courses include physical and processing metallurgy, theory of metals, etc. Thesis subject: "The Effects of Some Deoxidizers and Heat Treatments on the Sulfide Distribution in Iron". Prefers research work with ferrous metals. Location East or Midwest preferred. Available September.

Missouri School of Mines and Metallurgy

Ralph L. Hollocher

Degree Expected: B. S. in Met. Eng.

School Address: Box 110, Rolla ,Mo.
Home Address: 3637 Childress, St. Louis 9, Mo.

Age 21, single, draft status 1-A. Major studies were foundry engineering and ferrous physical metallurgy. F.E.F. Scholarship, Honor Roll, Tau Beta Pi. President A.F.S., editor of Yearbook, president Pi Kappa Alpha, Blue Key, Student Council, Theta Tau. Worked two summers in small foundry, one summer on training program of large automotive foundry. Desires foundry industry or ferrous production or research. No location preference. Available June 10.

Richard M. Pracht

Degree Expected: B.S. in Met. Eng.

School Address: 1206 Elm St. Rolla, Mo.
Home Address: Williamsville, Mo.

Age 21, single, draft status 2S (until Aug. 1954). Studies include electrometallurgy, process metallurgy, radiography, high-temperature reactions and refractories. Experience: Summer employment with Aluminum Co. of America. Desires processing or producing industry in aluminum, magnesium or ferrous metals. Midwest area preferred. Available June.

Mohammad Khaliloor Rahman

Degree Expected: B.S. in Met.

School Address: 901 West 12th Street, Rolla, Mo.
Home Address: Same.

Age 24. Electives include process physical metallurgy, refractories, high-temperature reactions. Experience: One summer in heat treating plant. Would like one year's work in ferro-manganese plant. Foreign student from India.

Ronald C. Rex

Degree Expected: B.S. in Met.

School Address: 401 East Seventh St., Rolla, Mo.
Home Address: 7330 Weil Ave., Shrewbury, Mo.

Age 21, married, active reserve. Extra-curricular activities: A.F.S., Sigma Phi Epsilon social fraternity. Served as secretary of school paper, member of inter-fraternity council. Industrial experience: Three summers in steel foundries, serving in laboratory as laborer and heat treater. Foundry production first choice; nonferrous extractive and production second. East preferred. Available June 1.

Anthony Joseph Selvaggi

Degree Expected: B.S. in Met. Eng.

School Address: 1201 State St., Rolla, Mo.
Home Address: 206 Littleton Ave., Newark, N. J.

Age 21, single, 1-D draft status. Courses include ferrous and nonferrous process metallurgy, physical chemistry and metallurgy, electrometallurgy, metallurgical calculations, foundry engineering, radiography, refractories, mineral dressing, machine and welding shop. One summer in gray iron foundry and two summers in steel foundry as assistant to the radiographer. Recipient of three F.E.F. scholarships. Desires ferrous producing industry in the East or Midwest. Available June 14.

Richard H. Stevens

Degree Expected: B.S. in Met. Eng.

School Address: 1108 Main St., Rolla, Mo.
Home Address: 1504 Hyde Park Blvd., Niagara Falls, N. Y.

Age 25, married, veteran. Courses include physical metallurgy, process metallurgy (both ferrous and nonferrous), foundry, mineral dressing, radiography, X-ray analysis, physical chemistry, metallurgical calculations and electrometallurgy. Worked one summer as research assistant on stainless steels in research laboratory. Desires research work, either ferrous or nonferrous. Prefers Midwest, Southwest or West, but not essential. Available June.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school.* *See list on pages 17 and 18.*

Missouri School (Cont.)

Joseph Trust

Degree Expected*: *B.S. in Met. Eng.

School Address: M.S.M. Apt's., S-6, Rolla, Mo.
Home Address: 2 Lee St., South River, N. J.

Age 33, married, veteran World War II. Courses include principles of metallurgy, physical metallurgy, foundry, metallurgical calculations, mineral dressing, ferrous metallurgy (iron and steel), nonferrous metallurgy, electrometallurgy, thermodynamics, special metallurgical problems. Eight years accounting. Desires industrial work, preferably Eastern Coast location. Available June.

Clyde E. Wick

Degree Expected: B.S. in Met.

School Address: 1203 State St., Rolla, Mo.
Home Address: 1048 No. Leamington Ave., Chicago 51, Ill.

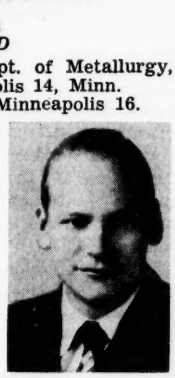
Age 21, single. Courses include regularly prescribed subjects leading to degree in metallurgical engineering. Has spent past two summers in the mineral dressing field. Worked as assayer's assistant, crushing and tailing-pond operator in lead and zinc mill (Colorado) 1952, assayer's and mining engineer's assistant in fluorspar mill (Colorado) 1953. Prefers mineral dressing industry. No location preference. Available February.

University of Minnesota

Richard A. Swalin

Degree Expected: Ph.D

School Address: 9 Appleby Hall, Dept. of Metallurgy, University of Minnesota, Minneapolis 14, Minn.
Home Address: 6920 Excelsior Blvd., Minneapolis 16.



Age 24, married, draft status 2A. B.S. in Met. Eng. University of Minnesota, 1951. Taconite Fellowship, 1951-1953; Research Fellow, 1953-present. Subject of thesis: "Atomic Mobility in Alloys of Nickel". Minor field physical chemistry. Work taken in thermodynamics and atomistics. Member: Tau Beta Pi, Phi Delta Theta, Gamma Alpha, A.I.M.E. Research work on projects sponsored by Air Force. Summer industrial employment. Available summer.

Mohawk Valley Technical Institute

Kenneth G. Rhodes

Degree Expected*: *Associate in Applied Science

School Address: 5 Hillside Ave., New Hartford, N. Y.
Home Address: Same.

Age 22, single, draft status 4F (not a hindrance to job ability). Major: mechanical technology including technical mathematics, machine tool application, mechanics, engineering drawing, strength of materials, machine design, industrial electricity, chemistry, metallurgy, tool design, production planning, physics, industrial instruments. Worked as production inspector for pneumatic tool company. Prefers metal product design in East or Northeast but not essential. Available June.

Montana School of Mines

James A. Ndulue

Degree Expected*: *B.S. in Meta. Eng; B.S. in Min. Dressing Eng.

School Address: Residence Hall, Montana School of Mines Butte, Mont.
Home Address: P. O. 5, Abakaliki, Nigeria, W. Africa.

Age 25, single, Nigerian (Africa) citizen, not subject to draft. Courses include mineralogy, process and physical metallurgy (ferrous and nonferrous), thermodynamics, applied electricity and mineral dressing. Summer jobs: Steel heat treating plant and in underground mining. Part time work: student assistant in mineral dressing research laboratory. Desires position in ferrous or nonferrous metal industry as metallurgical or mineral dressing engineer. Location peferred: Africa, West Indies or Western U. S.

John Zelem

Degree Expected*: *B. S. in Met. Eng.

School Address: Residence Hall, Montana School of Mines, Butte, Mont.
Home Address: 311-11th Ave., East, Calgary, Alberta.

Age 27, single, Canadian, not subject to draft. Thesis on "Electrolytic Indium Purification". Courses: Process and physical metallurgy (ferrous and nonferrous), chemical thermodynamics, electricity and mineral dressing. Member of fraternity. Hockey. Summer work in Cu concentration mill, Cu reverberatory furnaces and underground mining, pilot mill operation, mining. Nonferrous producing industry or mineral dressing mill. Any location. Available June 15.

University of Notre Dame

Raymond M. Bara

Degree Expected: B. S. in Met.

School Address: 734 N. Notre Dame Ave., South Bend, Ind.
Home Address: 42 Raritan Ave., South River, N. J.

Age 24, single, obligated to serve three years active duty in the air force upon graduation. Courses include physical metallurgy, metallurgical thermodynamics (phase diagrams), physical testing of metals, ferrous and nonferrous physical metallurgy, ferrous and nonferrous extractive metallurgy, physics of metals and mineral dressing. Worked for two years, part-time, in cast iron foundry in laboratory making chemical analyses of irons. Prefers ferrous producing industry or nonferrous producing industry. Midwest preferred. Available September 1957.

Carl F. Leitten Jr.

Degree Expected: B.S. in Met.

School Address: 105 Walsh Hall, Notre Dame, Ind.
Home Address: 50 Hawkins Ave., Hamburg, N. Y.

Age 21, single, draft status 4-F. Physical and extractive metallurgy. Metallurgy club, summer work in foundry, metallurgy testing laboratory and steel plant. Prefers producing industry preferably in steel or aluminum. Buffalo preferred but not essential. Available June 10.

New York University

Gerald Abowitz

Degree Expected: B.S. of Met. Eng.

School Address: 160 East 3rd St., New York 9, N. Y.
Home Address: Same:

Age 21, single, draft status, Army Reserve officer. Courses include physical metallurgy, physics of metals, metals technology, metallurgical engineering, production of metals. Member Tau Beta Pi, Deans Honor List 1951-1954. Vice-President student chapter A.I.M.E. Desires research work in nonferrous metals. Eastern location preferred. Available June 15.

Vernon Eugene Adler

Degree Expected: B.S. in Met. Eng.

School Address: New York University, College of Engineering, University Heights, New York City.
Home Address: 23 Allar Place, Yonkers 4, New York.

Age 20, single, draft status 1A. Prescribed metallurgical engineering curriculum emphasizing physical metallurgy. Electives include industrial engineering courses. Extra-curricular activities include: One year treasurer N.Y.U. Student Chapter A.S.M.-A.I.M.E. and student member throughout college. Summer job as assistant metallurgical technician for aeronautical corporation, and in welding metallurgy department. Desires sales engineering or quality control work. Prefers East Coast. Available June.

Martin Epner

Degree Expected: B.S. in Met. Eng.

School Address: 143-63 Cherry Ave., Flushing 55, N. Y.
Home Address: Same

Age 23, single, draft status 1A. Studies include: Physical chemistry, physical metallurgy, quantitative analysis, physical properties of materials, production of metals, physical metallurgy laboratory, metals technology, materials testing laboratory. Thesis on "Electrolytic Production of Titanium". Full-time and part-time experience as research aid in metallurgical research laboratory. Desires research in titanium-producing industry. East preferred. Available June 15.

Curtis M. Jackson

Degree Expected: B. of Met. Eng.

School Address: 367 East 201 St., New York 58, N. Y.
Home Address: Same.

Age 21, single, draft status 2S. Courses include physical metallurgy, metallurgical laboratory, theory, production and physical properties of metals, metallurgical calculations, ferrous and nonferrous metallurgy, metallography, physical chemistry, thermodynamics, strength of materials, statistics. Thesis: "Titanium-Indium System". President A.S.M. and A.I.M.E. student chapters. Summer experience with the Electro Metallurgical Co and the Copper and Brass Research Assoc. Prefers research or production work. No territory preference. Available July 1.

Samuel Bradford McRickard

Degree Expected: B.S. in Met. Eng.

School Address: 36 Sherman Ave., Yonkers 5, N. Y.
Home Address: Same.

Age 21, single, 1 S-C draft status. Courses mainly in physical metallurgy and metals technology; included were thermodynamics, experimental physics and quality control. Dean's list three years. Experience as part-time assistant in University's research laboratory; also summer work in metallurgy laboratory of large industrial plant with wide variety of problems handled. Last semester included original research for thesis on "Physical Metallurgy". Desires similar work in industrial plant or nonferrous producing industry. East preferred. Available June 14.

Edward J. Mullarkey

Degree Expected: B. of Met. Eng.

School Address: 1020 Soundview Ave., New York 72, N. Y.
Home Address: Same.

Age 26, married, veteran. Courses include regularly prescribed subjects leading to degree with an emphasis on physical metallurgy. Thesis: "Production of Calcium From $CaSi_2$ by Reduction With Titanium". Employed one summer doing general fabricating of plate and structural work, including stainless steel. Employed one summer by major steel company doing general metallurgical analysis involving cold rolled stainless steels, toolsteels and magnetic alloys. Prefers industrial plant or producing industry. Available June.

Winston R. Seetoo

Degree Expected: B. of Met. Eng.

School Address: 152 East 27th St., New York 16, N. Y.
Home Address: Same.

Age 22, single, draft status 4F (poor eyes). Studies include physical chemistry, strength of materials, ferrous and nonferrous physical metallurgy, metals technology, physics of metals, statistical methods, production of metals, metallurgical engineering. Thesis: "Ti-In Phase Diagram". Professional societies. No location preference. Available June 15.

Myron M. Skrill

Degree Expected: B.S. in Met. Eng.

School Address: 2715 Grand Concourse, Bronx 68, N. Y.
Home Address: Same.

Age 21, to be married in June, draft status 2-S. Emphasis is on physical metallurgy, materials engineering. Background physics, chemistry. Electives: Engineering law, distribution, engineering economics, industrial management, quality control. Thesis: "Construction of Ti-Sb Phase Diagram". Some business experience. Member A.I.M.E. Plans graduate school in the evenings. Desires nonferrous fields, light metals, titanium. Aim: Management. Preference for New York area, but not essential. Available June 7.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school. See list on pages 17 and 18.*

New York (Cont.)

Sid W. Turner

Degree Expected: B. of Met. Eng

School Address: 1011 Sheridan Ave., New York 56, N. Y.
Home Address: Same.

Age 23, married. Studied prescribed subjects as well as statistical methods, quality control and industrial management. Final year research project and thesis on the "Electrolytic Extraction of Titanium". Experience: Four months in heat treating plant, nine months as student assistant at N.Y.U. metallurgy research laboratory. Desires producing industry or sales engineering. Eastern U. S. desired, N. Y. metropolitan area preferred. Available June.

Ohio State University

Thomas C. Byrer

Degree Expected: B. of Met. Eng.

School Address: 2305 N. High St., Columbus, Ohio
Home Address: 1389 Maryland Ave. S.W., Canton, Ohio

Age 24, to be married in June, draft status 2S. Courses include physical metallurgy, corrosion, alloy systems, electronics, thermochemical mineralogy, theory of metals. Member Tau Beta Pi, Engineer's Council, technical societies. Three summers in steel mill research laboratory, three years part-time corrosion work at Ohio State Research Foundation. Desires position in development or production. No regional preference. Available June 21.

C. James Dyer, Jr.

Degree Expected: B. Met. E. and M.S.

School Address: 2604 Tremont Rd., Columbus 12, Ohio
Home Address: Same

Age 22, single, commission in inactive reserve. Courses include mineral dressing, physical metallurgy, fuels, chemical physics, castings, corrosion, etc. M. S. thesis on "Copper Recovery From Scrap Armatures". Honors include Tau Beta Pi, Sigma Gamma Epsilon, Phi Lambda Upsilon, Phi Eta Sigma, N.D.T.A. award. Other activities, Sigma Nu president, Executive Committee of Council of Fraternity Presidents, also technical societies. Experience includes foundry, research assistant, laboratory instructor. Desires production or development work anywhere. Available June 15.

Norbert D. Greene, Jr.

Degree Expected: M.S. in Met.

School Address: 83 West Lane Ave., Columbus 1, Ohio
Home Address: 163 Conrad Drive, Rochester 16, N. Y.

Age 22, single, draft status 1A. B.S. degree in chemical engineering. Advanced courses in chemistry, physics, physical metallurgy and metallic corrosion. Research investigations in high-temperature oxidation protection, improvement of corrosion screening tests and corrosion in nitric acid at elevated temperatures. Summer experience in industrial fluid agitation laboratory, also sheet metal and woodworking shops. Desires research or development work in chemical or metals industries. Anywhere. Available June.

Robert G. Henning

Degree Expected: B. of Met. Eng.

School Address: 149 West Tenth Ave., Columbus 1, Ohio
Home Address: 917 Tiffin Ave., Hamilton, Ohio

Age 23, single, inactive reserve. Courses include metallography, physical metallurgy, theoretical metallurgy, corrosion, mineralogy and cast metals. Has worked in steel plant metallurgical laboratory and corrosion laboratory. Prefers production or development. Available Jan. 1.

William L. Larsen

Degree Expected: Ph.D. in Met.

School Address: Dept. of Metallurgy, Ohio State University, Columbus 10, Ohio

Home Address: 61 West Patterson Ave., Columbus 2, Ohio

Age 27, single, draft status 1-D; Lt.(jg), U. S. Naval Reserve Research Co. 4-7. B. of Mech. Eng., Marquette University, 1948; M.S. in physics, Ohio State University 1950. Considerable experience with X-ray diffraction. Graduate study in solid state physics, physical metallurgy; research on molybdenum alloy oxidation. Member Tau Beta Pi. Battelle Memorial Institute fellow 1948-1950. Presently research associate, Ohio State University. Prefers fundamental research, any location. Available early 1955.

Pennsylvania State College

Charles H. Kreischer, Jr.

Degree Expected: B.S. in Met.

School Address: Box 1573, McKee Hall, State College, Pa.
Home Address: 216 N. 12th St., Sunbury, Pa.

Age 21, single, draft status 2S. Courses include ferrous and nonferrous extractive metallurgy and metallography, advanced physical and chemical metallurgy, metallurgical investigations, mineralogy, refractories, physical chemistry, and engineering mechanics. Dean's list, honorary fraternities, intramural sports. Departmental work in spherical single crystal laboratory including development and construction of equipment. Research or development work in East preferred. Available July 1.

J. Richard Lemyre

Degree Expected: B.S. in Met.

School Address: Sigma Chi, State College, Pa.
Home Address: 3 Lincoln Ave., Merrick, N. Y.

Age 21, married, Air Force R.O. T.C. Basic ferrous and nonferrous metallurgy, mineral preparation, physical chemistry, economics. Student body president, junior class president, Student Court, co-captain of wrestling team, full scholarship throughout college. Production or sales. No regional preference.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school. See list on pages 17 and 18.*

Penn State (Cont.)

Richard W. Smedley

Degree Expected: B.S. in Met.

School Address: Theta Xi Fraternity, State College, Pa.
Home Address: Whitney Rd., Columbia, Conn.

Age 21, single, A.F.R.O.T.C. Courses include physical chemistry, business law, basic ferrous and nonferrous metallurgy, metallography, advanced chemical metallurgy, advanced physical metallurgy. Distinguished military student. President Theta Xi Social Fraternity; president Sigma Gamma Epsilon; member Tau Beta Pi, Phi Lambda Upsilon. Summer work past two years in quality control. Desires work in industrial operations—ferrous industry. No location preference. Available July 1, if not called to active duty U.S.A.F.

Purdue University

Donald G. Harrington

Degree Expected: B.S. in Met. Eng.

School Address: Box 345, Cary Hall, West Lafayette, Ind.
Home Address: 314 University Ave., Muncie, Ind.

Age 21, single, draft classification 2S. Subjects liked best: Nonferrous metallography, nonferrous production metallurgy, physical chemistry, statistics and quality control and instrumentation. Member of Sigma Gamma Epsilon honorary. Enjoys swimming, canoeing, golf and bridge. Experience includes work in electroplating plant and helping on research project in ultrasonic testing. Interested in nonferrous foundry, no location preference. Available July.

Elliott Rennhack

Degree Expected: B.S. in Met. Eng.

School Address 319-4 FPHA W. State St., W. Lafayette, Ind.
Home Address: 57 Haig Rd., Valley Stream, L. I., N. Y.

Age 23, married, 4F due to football injury. Worked with solid state physics group on germanium and molybdenum as technician. Has worked on controlled atmosphere furnaces and high-vacuum systems. Courses include ferrous, nonferrous, production, physical metallurgy, electrometallurgy, igneous solutions, metallurgical rerearch problems, X-ray, X-ray diffraction, plastic metallurgy, crystallography, instrumentation, physical chemistry. Desires research and development in East. Member A.I.M.E. Available June.

Douglas J. Roth

Degree Expected: B.S. in Met. Eng.

School Address: Box 444, Hall "X", West Lafayette, Ind.
Home Address: 118 East Orchard St., South Bend, Ind.

Age 21, single, Army R.O.T.C. graduate. Courses include physical metallurgy, physical chemistry, production metallurgy, physics, X-ray technology, crystallography, geology, sales engineering, phase diagrams. Member Tau Beta Pi, Sigma Gamma Epsilon, Pershing Rifles. Prefers research and development in either ferrous or nonferrous industry. Midwest preferred but not essential. Available August 9.

Richard P. Waugh

Degree Expected: B.S. in Met. Eng.

School Address: Box 996, Cary Hall, West Lafayette, Ind.
Home Address: Squawbuck Rd., Columbia City, Ind.

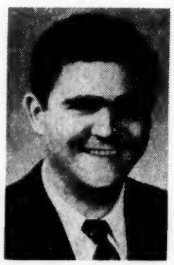
Age 21, single, draft status 2-S. Courses include physical metallurgy, ferrous and nonferrous metallography, ferrous and nonferrous production, electrometallurgy, mineralogy, crystallography, X-ray technology, and general engineering courses in other fields. Tau Beta Pi, other honorary and technical societies. Purdue Special Merit and Armco Foundation scholarships. Prefer development or production in Midwest, East or West. Available June.

University of Pennsylvania

Rinaldo A. Paci

Degree Expected: B.S. in Met. Eng.

School Address: 2124 S. Alden St., Philadelphia, 43, Pa.
Home Address: Same



Age 28, married, draft status 5-A. Courses include physical metallurgy, ferrous and nonferrous chemical metallurgy, mechanical metallurgy, physical chemistry. Five years experience with E. F. Houghton: two years as technician (exp't. heat treating); and three years as foundry technician. Currently working 32 hours a week while attending school. Spent past summer as sand technician in steel foundry. Prefers foundry or foundry research. No territory preference. Available June 21.

Rensselaer Polytechnic Institute

Merrill F. Gendron

Degree Expected: B. of Met. Eng.

School Address: 844 Third Ave., Troy, N. Y.
Home Address: Same

Age 22, single, member of Army R.O.T.C. Principal studies in physical metallurgy, X-ray metallography, nonferrous alloys, alloy steels, metallography, electrometallurgy, metallurgical thermodynamics, principles of metallurgy, production metallurgy, metal castings and introduction to nuclear reactor technology. Member of Tau Beta Pi, A.O.A. Desires development work. Northeast preferred but not essential. Available August 16 for one year. Available for continued employment following required two years of active duty in Army under R.O.T.C. plan.

Michael B. J. Hornak

Degree Expected: B. of Met. Eng.

School Address: 45 Maple Ave., Troy, N. Y.
Home Address: 425 7th St., Donora, Pa.

Age 22, single, Air Force R.O.T.C. Courses include physical metallurgy, physical chemistry, thermodynamics, inspection of metals, nuclear engineering and science, electrometallurgy, ferrous metallurgy, production metallurgy and metallography. Alumni scholarship. Scoutmaster, varsity football. Worked summers in blast furnace and power plant construction (jr. electrical inspector). Desires combination of production and development work. Northeast preferred but not essential. Available June 15.

Rensselaer (Cont.)

John F. Hubert

Degree Expected: B. of Met. Eng.

School Address: 132 Oakwood Ave., Troy, N. Y.
Home Address: R.D. #2, Waterford, Pa.

Age 21, single, draft status 2A-S to June 15, 1954. Prescribed subjects in physical metallurgy option with ferrous metallurgy electives. Extra-curricular activities include lacrosse and track, yearbook and publications, treasurer of fraternity, part-time work. Honors: Pi Delta Epsilon. Experience: Three summers squeeze molder, two in malleable iron foundry and one gray iron foundry. One summer physical metallurgical laboratory. Preference: Production work in steel, or in progressive ferrous or nonferrous foundry. East to Midwest. Available June 15.

Gerald W. Hulit

Degree Expected: B. of Met. Eng.

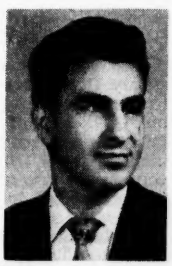
School Address: 31 Belle Ave., Troy, N. Y.
Home Address: Baldwin Gardens, Apt. 2-A1, Baldwin, N. Y.

Age 21, single. Courses: Metallography, physical metallurgy, nonferrous alloys, electrometallurgy, alloy steel, metallurgical thermodynamics, physical chemistry and machine design. Experience in metallography laboratory, summer 1953 and plastics laminating laboratory, summer 1952. New York State Regents Scholarship. Prefers work in steel treating, eastern location.

Louis Ianniello

Degree Expected: B. of Met. Eng.

School Address: 214 N. Fourth St., Mechanicville, N. Y.
Home Address: Same



Age 20, single, draft status 2-S. Courses include regular metallurgical subjects. Summer experience in stainless steel plant. Desires development work anywhere in U. S. Available mid-June.

Richard M. Ingersoll

Degree Expected: B. of Met. Eng.

School Address: Clement 24, Sage Ave., Troy, N. Y.
Home Address: 41 Beacon St., Glouster, Mass.

Age 21, single, draft status 2-S. Courses include metallography, physical metallurgy and chemistry, electrometallurgy, inspection of metals, ferrous metallurgy, welding processes and applications, production metallurgy, thermodynamics, and time and motion study. Dean's list. One summer industrial experience in stainless casting industry. Prefers production engineering or development work in ferrous industry. Location preferred in East, Midwest, or abroad. Available mid-June.

William F. Mertins

Degree Expected: B. of Met. Eng.

School Address: 36 First St., Troy, N. Y.
Home Address: 44-74 23rd St., Long Island City 1, N. Y.

Age 22, single, reserve commission in Navy upon graduation. Courses include principles of metallurgy; physical, production, ferrous and nonferrous metallurgy; thermodynamics; metallography; electrometallurgy; inspection of metals. Campus Club secretary-treasurer; fraternity president. Worked past summer for Remelt Division of Alcoa. One year as laboratory assistant at the Schenectady Works Laboratory of the General Electric Co. Prefers producing industry or manufacturing plant or sales. No geographic preference. Available July 1.

David G. Miller, Jr.

Degree Expected: B. of Met. Eng.

School Address: 2170 14th St., Troy N. Y.
Home Address: 679 Catherine St., Peekskill, N. Y.

Age 24, single, draft status 1-D (member Army R.O.T.C.). Courses include metallography, analytical and physical chemistry, strength of materials, metal casting, forming and welding, production metallurgy, physical metallurgy, alloy steels, inspection of metals, metallurgical thermodynamics, electrometallurgy. Experience: Two years laboratory assistant in light metals (magnesium) research; summer employment in precision investment casting of copper-beryllium and aluminum alloys. Prefers work in light metals field, production or development. Midwest preferred. Available September.

Thomas C. Price, Jr.

Degree Expected: B.S. in Met. Eng.

School Address: 243 Hoosick St., Troy, N. Y.
Home Address: 7919 Rock Creek Rd., Richmond, Va.

Age 22, non-veteran, 2S draft status. Single. Courses include German, engineering mathematics, ferrous metallurgy, physical metallurgy, production metallurgy, welding processes, metallography, thermodynamics, electrometallurgy, alloy steels, nonferrous alloys. Prefers work in ferrous metals. Northeastern U.S.

Henry N. Rosenblatt

Degree Expected: B. Management Eng.—Met. Option

School Address: 7 Wayne St., Troy, N. Y.
Home Address: 640 Elmgrove Ave., Providence, R. I.

Age 21, single, will receive Air Force Reserve Commission June. Courses include: Physical chemistry and metallurgy, production metallurgy, engineering metallurgy, motion and time study, production planning and control and personnel relations. Desires production and sales field, preferably in the New England Area. Available July 1.

FOR FURTHER INFORMATION about these graduates *Write direct to student or to head of metallurgy department or placement bureau at the school. See list on pages 17 and 18.*

Stanford University

Steven John Rothman

Degree Expected: PH.D. in Met.

School Address: BLDG 205, Apt. 10, Stanford Village, Stanford, Calif.

Home Address: Same

Age 26, married, one child, draft status 4F. Courses include metallography, physics of metals, thermodynamics, mathematical physics. Thesis: "Diffusion in Some Liquid Metal Systems". Some experience with radioactive tracer technique. One and a half years as research assistant on government research contract. One year as teaching assistant in spectrographic analysis. Desires laboratory research or development position, preferably basic research. Prefers work located in California or New England. Available in September.

University of Tennessee

Charlie Ray Brooks, Jr.

Degree Expected: B.S. in Chem. Eng.

School Address: Box 72, South Stadium, Knoxville, Tenn.

Home Address: Rt. 4, Rogersville, Tenn.

Age 22, single, 4-F draft status. Courses in metallurgy include physical metallurgy, production and fabrication and metallurgy thesis. Courses in chemical engineering include thermodynamics, fluid flow, heat transfer, evaporation, drying, extraction, distillation, adsorption and laboratory courses dealing with unit operation equipment. Prefers development and/or research work dealing with application of metallurgy to chemical engineering problems. President A.I.Ch.E., Alpha Chi Sigma. No preference to location. Available June 15.

Texas Western College

Julius S. Furman

Degree Expected: B.S. in Mining Eng.
(Metallurgy Option)

School Address: P.O. Box 147, El Paso, Texas

Home Address: 61 Bowen St., Providence, R. I.

Age 31, veteran of World War II and Korea. Courses include physical metallurgy, metallography, corrosion, physical chemistry, extractive metallurgy, mining methods, metallurgical calculations and ore dressing in addition to required courses. Vice-president A.I.M.E. Chapter, member honorary fraternity. Summer work as trainee metallurgist at steel plant in rolling mill and openhearth departments. Desires job in steel producing industry in Southwest, but not essential. Available February.

Victor Levy

Degree Expected: B.S. in Met.

School Address: Hudspeth Hall, Texas Western College, El Paso, Tex.

Home Address: 1921 South Blvd., Dallas, Tex.

Age 26, single, veteran 4A. Courses include metallography, physical metallurgy, ferrous and nonferrous smelting metallurgy, ore dressing, physical chemistry, thermodynamics, chemical engineering, metallurgical calculations, research work in aluminum. Worked as chemist and metallurgist in aircraft processing. Desires work in research and development of titanium, aluminum or steel. No regional preference. Available June.

Robert K. Little

Degree Expected: B.S. in Met. Eng.

School Address: R. R. #1, Box 526, El Paso, Tex.

Home Address: Same

Age 26, married, one child, draft status 3-A. Courses include physical metallurgy, ferrous and nonferrous metallurgy, metallography, advanced ore dressing, corrosion, electric circuits, leaching processes, metallurgical calculations and physical chemistry. Thesis: "Slag and Melt of the Copper Anode Furnace". Activities: S.A.E. fraternity and president of the junior class. Worked two years in ferrous production and three months underground as laborer. Desires producing industry or research in nonferrous metals, Western states. Available June 1.

University of Utah

J. Lyman Ballif

Degree Expected: M.S. in Met.

School Address: 240 University St., Salt Lake City 2, Utah

Home Address: Same

Age 28, married, one child, veteran. B. S. degree in Mech. Eng. Major: physical metallurgy; minor: applied statistics. Emphasis in heat treating, statistical methods and quality control. Thesis: "Statistical Analysis of Hardenability Factors". Five years of industrial engineering experience in nonferrous metals industry. Would like position in process analysis and control or general process engineering. No preference in location. Available June 15.

University of Washington

Kenneth M. Kolb

Degree Expected: M.S. in Met. Eng.

School Address: 719 Yesler Way, Seattle, Wash.

Home Address: Same

Age 29, married, no children, V-A status. Courses include: Ferrous, nonferrous metallurgy, advanced metallurgy, theory of metals and alloys, X-ray spectrography, metallurgical inspection of metals and required courses for graduation in chemical engineering and industrial engineering. Experience: Two years chemical engineering research and production in hydrometallurgy of zinc and tin; six months design plant facilities and equipment. Production, research or sales. Locate anywhere. Available July 1.

Jack A. May

Degree Expected: B. of Eng. Met.

School Address: 5547 30th Ave. N.E., Seattle, Wash.

Home Address: 741 West 111 St., Los Angeles 44, Calif.

Age 31, single, veteran. Courses include physical metallurgy, metallography, assaying, calculations, physical chemistry, electrical engineering and foundry practices. Electives include nondestructive and X-ray examination, theory of alloys, hardenability and steel selection, business organization and management, human relations and other humanity courses. One year as assistant laboratory instructor at University and one summer as process analysis. Prefers producing industry on the West Coast, but will consider any location. Available in April.

State College of Washington

Wallace Duane Steindorf

Degree Expected: B.S. in Phys. Met.

School Address: Ferry Hall, Pullman, Wash.
Home Address: 308 N. Tukanon, Walla Walla, Wash.

Age 22, single; draft status 1D, will receive a reserve commission in the U.S.A.F. in June or be 1A. Undergraduate thesis: "Study of Grain Growth in Aluminum Bronze". Courses in X-rays, ferrous and nonferrous physical metallurgy, phase diagrams and corrosion. Recipient of $100 scholarship from School of Mines; Sigma Gamma Epsilon. No experience. No preference as to type of work or location. If not taken into armed forces will be available in July.

Wayne University

Frank Kielniarz

Degree Expected: B.S. in Met. Eng.

School Address: 17183 Conley, Detroit 12, Mich.
Home Address: Same

Age 22, single, draft status 2-S. Subjects include physical metallurgy, metallography, electrometallurgy, X-ray, castings and pyrometry. Electives in corporation finance, statistics, organization and management. Lab assistant two semesters, assistant to metallurgical consultant 2½ years, three months industrial practice in metallography. President of Engineering Student Board, treasurer and secretary of metallurgical society, member AIMME. Desires ferrous producing industry. Midwest. Available June.

University of Wisconsin

Everett H. Belter

Degree Expected: B.S. in Met. Eng.

School Address: 640 No. Henry St., Madison 3, Wis.
Home Address: 414 Marshall St., Eau Claire, Wis.

Age 25, single, veteran U. S. Army. Courses include foundry metallurgy, physical metallurgy, X-ray, extractive metallurgy, mineral dressing, alloys and properties. A.I.M.E. president student chapter, Alpha Delta Phi president. Summer experience in foundry and welding metallurgy. Would like product or process development work anywhere in world. Available Feb. 15.

Leroy E. Johnson

Degree Expected: B.S. in Met. Eng.

School Address: 660 State St., Madison, Wis.
Home Address: 3209 W. Silver Spring, Milwaukee, Wis.

Age 21, single, draft status 1-D. Courses include physical metallurgy, heat treatment, calculations, physical chemistry, foundry practice, mineral dressing, iron and steel, nonferrous metallurgy. Air Force R.O.T.C. Pro baseball. Summer experience in welding shop. Desires industrial work in producing or training for management. Location midwest or far west preferably. Available July 1.

Edwin S. Tankins

Degree Expected: B.S. in Met. Eng.

School Address: 419 N. Murray St., Madison, Wis.
Home Address: Same

Age 26, single, veteran, draft status 5-A. Courses include ferrous and nonferrous metallurgy, physical metallurgy, metallurgy of surfaces, calculations and other courses required. A.I.M.E. and other professional societies, Reserve Officers Association of America. Theta Tau Fraternity, Junior Chamber of Commerce and president of student house. Experience as painting contractor, 5 years. Contracts included industrial and commercial jobs. Business experience giving estimates, management labor relations, cost analysis, records, taxes. Consulting in connection with paints and corrosion. Military experience. Available mid-summer.

Jerald L. Wuhrman

Degree Expected: B.S. in Met. Eng.

School Address: 525 State St. Apt. #5, Madison, Wis.
Home Address: 1440 N. 25th St., Milwaukee 5, Wis.

Age 22, married with one child, draft 1D. All required general metallurgy courses. A.S.M. scholarship. Co-captain of varsity football team. Prefers sales or production work in nonferrous. Midwest-Milwaukee area, or West as second choice, depending on opportunity. Available Sept. 1.

Yale University

Robert S. Bray

Degree Expected: M. Eng.

School Address: Box 2005, Yale Station, New Haven, Conn.
Home Address: 22 Boylston St., Meriden, Conn.

Age 27, married, one daughter, draft exempt-disabled veteran World War II. Major studies physical metallurgy. Master's thesis on "Cold Work Internal Friction Effects". Student Member A.I.M.E. President Yale Metallurgical Society 1952-53, Member Alphi Chi Sigma. Desires work in applied research or development, any location, will be available about July 1.

Youngstown College

Frank S. Deronja

Degree Expected: B.S. in Met. Eng.

School Address: 1126 Hamilton Ave., Farrell, Pa.
Home Address: Same

Age 22, single, draft status 2S. Studies include ferrous and nonferrous metallurgy, physical and mechanical metallurgy, physical chemistry, metallurgical calculations, metallography, fuels, furnaces, electrical engineering, technical report writing. Honorary engineering fraternity (secretary), dean's list, technical organizations. Summer in industrial lab. Desires research or production with opportunity for part-time graduate study in East. Available June 1.

A. S. M. Review of Current Metal Literature

An Annotated Survey of Engineering, Scientific and Industrial Journals and Books Here and Abroad Received During the Past Month

Prepared in the Library of Battelle Memorial Institute, Columbus, Ohio

Stewart J. Stockett, Technical Abstracter

Assisted by Fred Body, Ardeth Holmes, Mildred Landon and Members of the Translation Group

A General Metallurgical

22-A. How to Promote Safety in the Foundry. *Canadian Metals,* v. 16, Dec. 1953, p. 26-27, 30.

How a foundry slashed accident rates by an intelligently planned and coordinated effort on the part of all from management to worker. Photographs. (A7, E general)

23-A. B.I.S.R.A. Laboratories at Sheffield. *Engineer,* v. 196, Nov. 27, 1953, p. 694-697.

Equipment for studying the making, working and metallurgy of steel. Photographs. (A9, ST)

24-A. Sheffield Laboratories of British Iron & Steel Research Association. *Engineering,* v. 176, Nov. 27, 1953, p. 683-685, 688.

Laboratory facilities including cold strip-rolling mill, hydraulic forging press, wiredrawing machine, melting furnaces and testing equipment. Photographs.
(A9, D general, F general, ST)

25-A. Practical Learning Curves Improve Shop Performance. C. T. Dennington. *Iron Age,* v. 172, Nov. 26, 1953, p. 108-111.

Charts to make mathematical concepts of time studies and estimates more meaningful to shop personnel. Graphs. (A5, A6)

26-A. Joint Effort Promotes Safety in Welding. N. I. Sax. *Iron Age,* v. 172, Dec. 10, 1953, p. 177-180.

Fire and accident prevention; health protection and safety standards for equipment. 9 ref.
(A7, K general)

27-A. Review of the Major Plant and Equipment Installed in the Sheffield Laboratories. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 498-504.

Melting facilities and metalworking research unit. Photographs.
(A9, ST)

28-A. Nonferrous Metal Industries in Yugoslavia. Joseph Zimmerman. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Nov. 1953, p. 7-9, 19.

Statistics on production and consumption. Tables.
(A4, Pb, Sb, Zn, EG-a)

29-A. The Light Metals Market. *Modern Metals,* v. 9, Nov. 1953, p. 85-87.

Tabulation by states of producers, fabricators, foundries, die casters, and product manufacturers for Al, Mg, and Ti. (A10, Al, Mg, Ti)

30-A. (German.) **Dust Problems in Steel Plants.** Kurt Guthmann. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1512-1524.

Dust separation, precipitation difficulties and grain size. Dust removal and separating plants and their efficiencies. Tables, graphs, diagrams, photographs. 37 ref. (A8)

31-A. Metallurgical Activities in Japan. Daniel J. Murphy. *Metal Progress,* v. 65, Jan. 1954, p. 67-71.

Reviews past and present research activities in refining, casting and testing ferrous and nonferrous metals and alloys. Photographs. (A9)

32-A. British Advances in Metals, Fabrication Methods and Applications. Tom Bishop. *Metal Progress,* v. 65, Jan. 1954, p. 101-104, 188, 190.

Brief review of activities in 1953 including: a new alloy steel; a new nickel alloy—"Nimonic 95"; corrosion of copper and its alloys; development of a new series of Cu-Mn-Sn alloys; installation of an interplanetary rolling mill; studies of wiredrawing techniques; and development of cast milling cutters. Photographs, diagram, table.
(A general, AY, Ni, Cu, CN)

The coding symbols at the end of the abstracts refer to the ASM-SLA Metallurgical Literature Classification. For details write to the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

33-A. B.I.S.R.A. Sheffield Laboratories. The Main Equipment. *British Steelmaker,* v. 19, Dec. 1953, p. 716-721, 723-724.

Electric arc furnace, four-high rolling mill, 200-ton forging press, wire drawing machine and equipment for high-frequency melting, vacuum fusion gas analyses and fatigue testing. Photographs. (A9)

34-A. Touch and Go in Nickel for Civilian Consumers. *Steel,* v. 133, Dec. 28, 1953, p. 27-28.

Nickel users are in for another siege of shortage unless the government revamps its present stockpile schedules. Photographs. (A4, Ni)

35-A. Shake-Up in World Trade Coming. *Steel,* v. 133, Dec. 28, 1953, p. 38-39.

War-induced shortages of steel disappeared in 1953; new world trade patterns, held back by emergency conditions, are now free to form. Competition will be intense. (A4, ST)

36-A. New Alloy Boost to Turbines Relief for Stockpile. Allen G. Gray. *Steel,* v. 133, Dec. 28, 1953, p. 68-70.

Nickel content of 16-25-6 alloy was reduced 40%, high-temperature properties are as good as ever and ductility is better than ever. Photographs, micrographs, tables.
(A4, Q general, SS)

37-A. 1954 Metalworking Facts and Figures. *Steel,* v. 134, Jan. 4, 1954, p. 157-204.

Statistics on production of goods, labor, prices, earnings, etc. Tables, graphs. (A4)

38-A. Steel's Forum on Technical Progress. *Steel,* v. 134, Jan. 4, 1954, 130 p.

Brief remarks by 321 executives of metalworking plants on steelmaking; nonferrous metal production; casting; materials and metallurgy; heat treating; inspection and testing; drives and controls; machining, tooling and gaging; forming; cleaning and finishing; joining and assembly; handling and packaging; lubrication; and service and maintenance. (A general)

39-A. Industrial Noise. Sound Control Panels Quiet Machines to Hike Worker Output. Cloyd Smith. *Western Metals,* v. 11, Dec. 1953, p. 52-54.

Sound-proof enclosures for equipment. Photographs. (A5)

40-A. (Book.) **Basic Engineering Metallurgy.** Carl A. Keyser. MacDonald and Co., Ltd., 43 Ludgate Hill, London E.C.4, England. 60s.

Theoretical physical metallurgy; steels; alloys; mechanical tests; powder metallurgy; electroplating and electroforming; machining and finishing; casting; and joining.
(A general)

41-A. (Book.) **Fundamentals of Physical Metallurgy.** Ralph Hultgren. 395 p. Macdonald & Co., Ltd., 43 Ludgate Hill, London E.C.4, England. 70s.

A wide field is covered in broad outline. Omissions noted are shell molding and continuous casting.
(A general)

42-A. (Book.) **Review of A.S.T.M. Research.** 22 p. 1953. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa. No charge.

Work of A.S.T.M. committees on electrodeposited metallic coatings; paint, varnish, lacquer and related products; porcelain enamel; corrosion of iron, steel and nonferrous metals and alloys; and on light metals and alloys.
(A9, L general, R general)

43-A. (Book.) **Saving Scarce Materials, PB 106425.** *(Bibliography of Technical Reports,* v. 17, no. 5, p. 197.) Anglo-American Council on Productivity. 33 p. Nov. 1951. Available from OTS, U. S. Dept. of Commerce, Washington 25, D. C. $0.50.

Reports on ferrous, nonferrous and light metal alloys; rare metals; and scarce alloying materials. Successful economy measures to save scarce metals; data showing substantial reductions in use of scarce alloying elements. Tables.
(A4, ST, Ni, Cr, Mn, Mo, W)

B

Raw Materials and Ore Preparation

22-B. Cobalt at Fredericktown. George P. Lutjen. *Engineering and Mining Journal,* v. 154, Dec. 1953, p. 72-76.
Equipment, plant layout and operating procedures. Photographs, diagram. (B10, Co)

23-B. Sintering Zinc Concentrates on the Blackwell 12 by 168 Ft. Machine. A. E. Lee, Jr. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1631-1633.
Machine and its operation; performance data. Diagram, photograph. 3 ref. (B16, Zn)

24-B. E&MJ Visits the General Superintendent at U. S.' Largest Titanium Mine. John H. Kearney and George P. Lutjen. *Engineering and Mining Journal,* v. 154, Dec. 1953, p. 83-88.
Equipment, plant layout and operating procedure. Photographs. (B12, Ti)

25-B. (Hungarian.) Production and Properties of Alloying Materials Necessary for the Manufacture of Manganese-Aluminum Alloys. Andras Domony and Rezso Varhelyi. *Aluminium (Budapest),* v. 5, no. 11, Nov. 1953, p. 236-241.
Emphasis on the importance of keeping out iron. Practical details of various processes. Micrograph, tables, graphs. 10 ref. (B general, Mn, Al)

26-B. (Russian.) Phase Composition of Certain Calcium-Chromium Slags and Particularly the Characteristic Water-Soluble Calcium in Them. D. S. Biliankin and V. V. Lapin. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 911-914 + 1 plate.
Various chromium - containing slags were investigated. Micrograph, tables. 6 ref. (B21, Cr)

27-B. Sinter for Open Hearth Charge. E. G. Hill. *Blast Furnace and Steel Plant,* v. 41, Dec. 1953, p. 1434-1436, 1438.
Need and use of sinter and its manufacture. Tables. (B16)

28-B. Erie Starts Big Taconite Project. *Steel,* v. 133, Dec. 14, 1953, p. 82.
Financing plans completed for program aimed at producing 10.5 million tons annually. (B16, Fe)

29-B. Mineral-Dressing Study of Manganese Ore, Cason Mine, Batesville, Ark. M. M. Fine and D. W. Frommer. *U. S. Bureau of Mines, Report of Investigations* 5005, Oct. 1953, 9 p.
Investigations made on button and carbonate ores to determine degree of concentration that could be effected by modern methods. Tables. 5 ref. (B14, Mn)

30-B. (French.) Industrial Tests Conducted at Kahlenberg, Germany, for the Enrichment of a Lorraine Ore by High Intensity Magnetic Separation. L. Coche. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 58, July 1953, 15 p.
Results of tests with Mont-Saint-Martin fines indicate need for careful crushing of ore to lessen amount of very fine particles and need for careful adjustment of apparatus. Tests showed it was possible to eliminate more than half of the gangue while losing only 10% of the iron. Describes installations. Diagrams, tables, photographs. (B13, Fe)

31-B. (French.) Magnetizing-Roasting Tests on French Iron Ores. P. Emery and J. Givaudon. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 60, Oct. 1953, 119 p.
Tests on low-grade siliceous Micheville ore and Mont-Saint-Martin ore in the Iron and Steel Research Institute reactor and tests of the latter ore in a tray furnace. Fluidization phenomena. Tables, graphs, diagrams. (B14, B15, Fe)

32-B. (Hungarian.) The Enriching of Manganese Mud With Simultaneous Desulfurization of Generator Gas. II. *Kohaszati Lapok,* v. 8, no. 8, Aug. 1953, p. 165-168.
Construction and operation of a pilot plant built for determining absorption of sulfur from generator gas by means of manganese mud under industrial conditions. Manufacturing plan developed on the basis of observations. Technology of application to various muds and ores. Diagram, photograph. 13 ref. (B22, Mn)

33-B. (Russian.) Intensification of Flotation Processing of Sulfide Minerals. I. I. Zozulia. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 964-968.
Wettability of surface can be effectively changed by means of gases formed in electrolytic dissociation of water directly in the pulp. Graphs, diagrams. 2 ref. (B14)

34-B. (Russian.) Viscosity Mechanism of Blast-Furnace Slag. A. M. Chernyshev, L. M. Tsylev, and A. V. Rudneva. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 1044-1057.
Viscosity of slag determined by measurements of complex silicate slag ions. Tables, graphs. 10 ref. (B21)

35-B. How and Why Solids Agglomerate. Carl Ludwig. *Chemical Engineering,* v. 61, Jan. 1954, p. 156-160.
Includes table, diagrams, photographs. (B14)

36-B. Scrap Preparation Program Improves Steel Quality. E. W. Hunziker. *Iron Age,* v. 172, Dec. 17, 1953, p. 132-136.
If purchased scrap is poorly prepared and segregated, quality and cost of steelmaking suffers. A positive program to improve scrap preparation combines efforts of dealers and consumers. Photographs, graphs. (B22, ST)

37-B. Ore Handling and Crushing System for Orinoco Mining Company —Puerto Ordaz, Venezuela. L. O. Millard. *Mines Magazine,* v. 43, Nov. 1953, p. 19-22.
Equipment, plant layout and operating procedures. Diagrams, photographs. (B13, A5, Fe)

38-B. Skubic Brothers Concentrator on Mesabi Iron Range. A. Tancig. *Skillings' Mining Review,* v. 42, Dec. 19, 1953, p. 1-2.
Equipment, plant layout and operating procedures. Photograph, flowsheet. (B14)

39-B. Dealer Program for Purchased Scrap Improves Quality, Rate of Production at USS Plant. E. W. Hunziker. *Western Metals,* v. 11, Dec. 1953, p. 65-68.
Scrap preparation and effect of scrap characteristics on quality and rate of production of finished steel. Photographs, graph. (B22, D general, ST)

40-B. (Book.) Manganese in the Iron and Steel Industry: Use, Recovery and Supplies. Organization for European Economic Cooperation. Her Majesty's Stationery Office, London. 3s. 6d.
Need for plentiful supplies of manganese in British iron and steel industry; briefly suggests means of conservation. (B22, D general, Mn)

C

Nonferrous Extraction and Refining

16-C. Gas Combustion Practice Described for Copper Smelters of the Southwest. Harold Foard. *Journal of Metals,* v. 5, Dec. 1953, p. 1629-1630.
Burners, controls and flame characteristics. Photographs. 2 ref. (C21, Cu)

17-C. Electrolytic Production of Manganese. T. Banerjee. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Oct. 1953, p. 457-462.
Equipment and operating procedures, including electrolytes, cells, electrodes and power requirements. Diagram. 34 ref. (C23, Mn)

18-C. Metal Melting Under Vacuum. Some Mechanical Problems Involved. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 259-260.
Furnace construction, temperature measurement and pouring procedures. Graph, diagram, photographs. (C25, D8, E23)

19-C. (Italian.) A View on Titanium Metallurgy. P. Spinedi. *Alluminio,* v. 22, no. 5, Oct. 1953, p. 523-537.
Problems of economical mass production of pure titanium. Tables, graphs, diagram. 46 ref. (C general, Ti)

20-C. Why Gas Fuel is Expanding Its Usefulness With Light Metal Alloys. C. George Segeler. *Gas Age,* v. 112, Dec. 17, 1953, p. 34-35, 75-77.
Reports increasing number of applications for gas fuel since technical and competitive problems of gas equipment have been solved. Photographs. (C21, J general, Al, Mg)

21-C. How Natural Gas Helps Make Aluminum, Key Material for Airframes. Arthur Q. Smith. *Gas Age,* v. 112, Dec. 17, 1953, p. 36-37.
Applications of natural gas to aluminum production. (C21, J general, Al)

22-C. Extraction of Thorium and Cerium From Monazite Sands of Travancore. I. R. K. Dutta. *Journal of Scientific & Industrial Research,* v. 12, sec. B, Oct. 1953, p. 485-488.
Laboratory method for preparation of thorium nitrate and cerium ammonium nitrate from Indian monazite. Tables. 6 ref. (C general, Ce, Th)

23-C. Extraction of Thorium & Phosphoric Acid From Monazite Sands of Travancore. II. R. K. Dutta and N. K. Dutta. *Journal of Scientific & Industrial Research,* v. 12, sec. B, Oct. 1953, p. 488-490.
Laboratory method for preparation of thorium nitrate and phosphoric acid from Indian monazite. Tables. 5 ref. (C general, Th)

24-C. Refining Low-Grade Copper. *Metal Industry,* v. 83, Nov. 27, 1953, p. 441-442.
Processes and equipment for recovery from low-grade ores, ash, residues and scrap. Photographs. (C21, A8, Cu)

25-C. (Hungarian.) Practical Aspects of the Thermodynamics of Magnesium Oxide Reduction. Andor Szulyovszky.

Aluminium (Budapest), v. 5, no. 9, Sept. 1953, p. 185-196.

Discusses thermodynamic data of magnesium reduction as basis for work necessary in starting a Hungarian magnesium industry. Tables, graphs. 14 ref.
(C general, P12, Mg)

D
Ferrous Reduction and Refining

21-D. Melting Metals Under Vacuum. *Canadian Metals*, v. 16, Dec. 1953, p. 16, 18, 20.

Induction furnace and facilities for pouring molten steel inside a vacuum container. Photographs, diagram, graph. (D8, TS)

22-D. Steel-Making Processes. James Mitchell. *Engineer*, v. 196, Nov. 20, 1953, p. 655-658.

Trends in methods of producing steel. States case for multiplication of units such as blast furnaces and steel furnaces rather than for an increase in unit size. Stresses that basic bessemer process should be given more serious consideration as an alternative to the basic openhearth. Pre-refining and duplexing methods for intermediate phosphorous irons critically discussed. Tables. (D general, ST)

23-D. Solidification of Steel. III. Casting Defects. T. B. King. *Iron & Steel*, v. 26, Dec. 1953, p. 562-568.

Cracking, hot tearing, shrinkage, porosity, metal penetration and sand burn-on of ingots and castings. 65 ref. (D9, E25, CI)

24-D. Symposium on Open Hearth Availability. *Iron and Steel Engineer*, v. 30, Nov. 1953, p. 55-59, 61-70; disc., p. 59-61, 65-66, 70.

Includes "Fuel and Its Usage", Edward E. Callinan; "Furnace Rebuilding", W. H. Shure; and "Furnace Design and Brickwork", H. C. Paxson. (D2, ST)

25-D. Expansion at the Steel Company of Wales. T. J. Ess. *Iron and Steel Engineer*, v. 30, Nov. 1953, p. 105-120.

Facilities, including coke plant, blast and openhearth furnaces, slabbing and hot strip mills and strip finishing equipment. Photographs, diagrams, tables.
(D general, F23, ST)

26-D. Large Electric Furnace of the Future May Be Six-Electrode Unit. Frank W. Brooke. *Iron and Steel Engineer*, v. 30, Nov. 1953, p. 123-124, 127, 129.

Furnace and its advantages. Photographs, diagrams. (D5, ST)

27-D. Can the Electric Furnace Compete With the Open Hearth? C. F. Ramseyer. *Journal of Metals*, v. 5, Dec. 1953, p. 1617-1621.

Operating costs and future possibilities. Graphs, photographs, tables. (D5, D2, ST)

28-D. Some Observations of Slag-Metal Relations in the Acid Open Hearth Steel Furnace. G. R. Fitterer. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1634-1640.

Trends in slag composition in acid openhearth practice, particularly variation in iron and manganese oxides during refining. Explains partially, through slag phase diagram considerations, a procedure which is currently being used to control refining reactions. Graphs, table, heat logs. 16 ref. (D2, ST)

29-D. Solid Phase Identification in Partially Reduced Iron Ore. Gust Bitsianes and T. L. Joseph. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1641-1647.

Technique developed for identifying solid phases in partially reduced iron ore. Reduction of dense iron ore was found to take place at distinct interfaces between well-defined layers of participating solid phases. Diagrams, tables, graphs, micrographs. 24 ref. (D1, M27, Fe)

30-D. Exchange of Iron Between Liquid Metal and Iron Silicate Slag. G. Derge and C. E. Birchenall. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1648-1650.

Using radioactive Fe^{55} as tracer, it was determined that equilibrium exchange of iron between silica-saturated iron silicate slag and liquid iron in a silica crucible follows first-order kinetics with a rate constant of 0.006 at 1600° C. Graphs. 6 ref. (D general, S19, Fe)

31-D. Steelmaking. I. Co-Operative Research in Steelmaking. A. H. Leckie. **II. Design and Operation of Open-Hearth Furnaces.** R. Mayorcas and A. H. Leckie. **III. Bessemer and Electric Steelmaking.** D. J. O. Brandt and W. H. Glaisher. **IV. Research on Process Chemistry.** C. E. A. Shanahan. **V. Ingots and Ingot Moulds.** W. H. Glaisher. *Metal Treatment and Drop Forging*, v. 20, Nov. 1953, p. 505-524.

Developments in research conducted by the BISRA. Photographs, diagrams, micrographs. 35 ref.
(D general, A9, ST)

32-D. Review of Russian Practice Reveals Rail Steel Production Methods. Carl A. Zapffe. *Journal of Metals*, v. 5, Dec. 1953, p. 1627-1628.

Russian work on flaking of steel forgings. Theory and effect of hydrogen. Table. (D general, F22, ST)

33-D. Scrap Preparation. Key to Quality and Economic Control. E. W. Hunziker. *Steel*, v. 133, Dec. 7, 1953, p. 145, 148, 150, 153.

Types of scrap for steelmaking and effect of scrap preparation on openhearth production. Graphs, photographs, table. (D2, B22, ST)

34-D. (French.) **Lines in Steels With a High Chrome Content.** M. Soubes. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, 1953, no. 11, p. 1763-1769.

Lines can be reduced by elaboration and basic casting in high-frequency furnace. In the arc furnace the substitution of magnesia reduces inclusions. Micrographs, graphs, table. (D6, ST)

35-D. (French.) **The Study of Conditions for a Good Distribution of Materials in the Blast Furnace.** Jean Vibrac. *Métallurgie et la construction mecanique*, v. 85, no. 11, Nov. 1953, p. 851, 853-854, 857, 859, 861.

Detailed discussion of loading apparatus, influence of method of loading on permeability; height of an optimum load; influence of the height of the level of loads; passage of gases at the throat; and diameter of the distribution bell. Graphs, diagrams. (To be continued.) (D1)

36-D. (German.) **Blast-Furnace Operation With Oxygen.** E. Diepschlag. *Chemische Technik*, v. 5, no. 10, Oct. 1953, p. 591-592.

Review of problem and investigations. Complexity of process and resulting ambiguity of conclusions concerning usefulness of application of oxygen. (D1)

37-D. (German.) **New Advances in Production of Pig-Iron in the Electric Low-Shaft Furnace.** Hermann Walde. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1441-1446.

Development of electric smelting. Compares low and high-shaft blast furnaces. Compositions of burden, pig iron and slag. Tables, diagram, photographs. 5 ref. (D1, CI)

38-D. (German.) **Improving Quality of Basic Converter Steel at the Iron and Steel Works at Domnarvet.** Bo Kalling. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1446-1452.

Desulfurization of pig iron, cost calculations, pre-refining and variables affecting quality. Effect of phosphorus, nitrogen and low carbon contents. Photographs, tables, diagrams, graphs. 19 ref.
(D3, ST, CI)

39-D. (German.) **Lining of Pig Iron Mixers.** Christian Bruchhausen. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1453-1457.

Comparison of mixers. Life of the lining, mechanical wear at mouth and discharge openings and insulation. Jointless masonry and grinding of magnesite bricks. Table, graphs, photographs. (D1)

40-D. (German.) **Lining of an 800-Ton Pig Iron Mixer With Dolomite Bricks.** Karl Mayer, Fritz Gareis, Sigismund Kienow, Helmut Knüppel and Gerhard Trömel. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1457-1462.

Trials with Halden dolomite bricks to decrease mixing and labor costs. Resistance to slag and mechanical attack. Table, photographs, micrographs. (D1)

41-D. (German.) **Lining an 800-Ton Pig Iron Mixer With Chemically Bound Magnesite Bricks.** Karl Mayer and Helmut Knüppel. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1463-1468.

Laying chemically bound bricks without mortar. Wear and formation of "cat's heads". Life of lining was better than with burned magnesite bricks. Photographs, graph, diagrams. 5 ref. (D1, CI)

42-D. (German.) **German Switchgear Construction in Iron and Steel Works.** Botho Fleck. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1480-1484.

Cut-off capacities of low voltage automatic circuit breakers and fuses. Differences in arrangement and operation between open and closed plants. Photographs, diagram, graphs. (D general)

43-D. (Russian.) **The State of Alumina in Melted Slags.** O. A. Esin and B. I. Lepinskikh. *Doklady Akademii Nauk SSSR*, v. 91, no. 5; Aug. 11, 1953, p. 1187-1190.

Explains a series of congruent-melting compounds including 5 CaO · $3Al_2O_3$, 2 CaO · Al_2O_3 · SiO_2, and CaO · Al_2O_3 · $2SiO_2$ in addition to CaO · Al_2O_3. Graphs. 5 ref.
(D general, B21, Fe, Al)

44-D. Low-Shaft Furnaces. Georg Bulle. *Blast Furnace and Steel Plant*, v. 41, Dec. 1953, p. 1429-1433.

Studies undertaken on European continent regarding use of low-shaft blast furnaces to smelt pig iron. Advantages and limitations. Diagrams. (D1, Fe)

45-D. Recuperators for Blast Furnaces. W. Trinks. *Blast Furnace and Steel Plant*, v. 41, Dec. 1953, p. 1437-1438.

Early attempts to install recuperators in connection with blast furnaces. Present impracticality. (D1)

46-D. Construction and Operation of Carbon Lining in Gary's No. 10 Blast Furnace. J. M. Walsh, Jr. *Blast Furnace and Steel Plant*, v. 41, Dec. 1953, p. 1439-1450.

Changes in furnace design, lining construction, curing the carbon, blowing-in and operation of furnace. Photographs, diagrams, tables, graphs. (D1)

47-D. Heat for Open Hearths. M. F. Hall. *Instrumentation,* v. 7, no. 1, 1953, p. 8-9.
Instruments indicate, record, integrate and automatically control flows of liquid and gaseous fuels. Photographs. (D2, S18)

48-D. Significance of Air Temperature in Open-Hearth Operation. John S. Marsh. *Instruments,* v. 26, Dec. 1953, p. 1876-1878, 1908, 1910.
A velocity thermocouple proves to be an accurate and sensitive tool for diagnosing openhearth furnace behavior. Its use shows that air temperature has large influence on heat time. Graphs, diagrams. 3 ref. (D2, S16)

49-D. Allegheny Ludlum. T. J. Ess. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 87-102.
Equipment, plant layout and operating procedures of two steel mills. Photographs, tables, diagrams. (D general, F general, ST)

50-D. Advanced Practices in Italy. Alberto Oreffice. *Metal Progress,* v. 65, Jan. 1954, p. 84-88, 136.
Description of equipment and methods employed by Fabbrica Italiana Automobili Torino, which manufactures Fiat motor cars. Includes electric iron smelting, electric steel production, control and research laboratory procedures and malleable foundry practice. Diagrams, photographs, table. (D5, E10, S12, ST, CI)

51-D. Evolution of the Thomas (Basic Bessemer) Steelmaking Process in Europe. G. Husson. *Metal Progress,* v. 65, Jan. 1954, p. 94-96, 168, 170, 172, 174, 176.
Improvements in controlling the basic bessemer blow, determination of end point and control of sulfur, phosphorus and nitrogen. Benefits achieved with oxygen-enriched blast. Photograph. 10 ref. (D3, CN)

52-D. New Manufacturing Processes for High-Grade Steel in Sweden. Bo Kalling. *Metal Progress,* v. 65, Jan. 1954, p. 108-111, 200, 202.
Review of trends in pig iron and steel tonnages. New developments in production of pig iron, sponge iron and steelmaking. Photographs, graphs. (D general, Fe, ST)

53-D. Refractories for the Basic Open Hearth Furnace. A. McKendrick. *Refractories Journal,* v. 29, Nov. 1953, p. 455-464.
Performance of various types of refractories. Tables. (D2, ST)

54-D. (French.) **Conditions for Favorable Distribution of Materials in the Blast Furnace.** Jean Vibrac. II. *Métallurgie et la construction mécanique,* v. 85, no. 10, Oct. 1953, p. 773, 775-777.
Problems of grain size necessitating sifting of the charges. Effect of grain size upon the contact between solids and gases, permeability coefficient, passage of the charge and losses. Graph. (To be continued.) (D1)

55-D. (Hungarian.) **Physicochemical Processes of Oxygen During Introduction Into the Openhearth Furnace.** O. J. Jacunszkaja and M. N. Sztarovics. *Kohaszati Lapok,* v. 8, no. 8, Aug. 1953, p. 168-176.
Modifications of openhearth process when gaseous oxygen is added. Increase in rate of reduction of the bath by direct oxidation, effect of various factors upon rate of oxidation of carbon and other elements, extent of metal oxidation and significance of exothermal reactions. Tables, graphs. 19 ref. (D2, ST)

56-D. (Swedish.) **Melting Lathe Chips by the Crofts Method.** *Gjuteriet,* v. 43, no. 9, Sept. 1953, p. 168-169.
Special feeding and mixing device for heating the chips to melting point in a nonoxidizing zone. Photographs, diagrams. (D8)

57-D. Basic Hearth Construction and Maintenance. G. Reginald Bashforth. *British Steelmaker,* v. 19, Dec. 1953, p. 704-711.
Causes of hearth failure, taphole construction, shape of hearth and fettling practices. Graph, photograph. 4 ref. (D2)

58-D. Production of Carbon Steel in Large Basic Electric Furnaces. R. J. Tremblay. *Industrial Heating,* v. 20, Dec. 1953, p. 2425-2426, 2428, 2430, 2432.
Manufacture of ingots by single slag method in furnaces charged with 100% scrap. (D5, CN)

59-D. Starches and Starch Products as Depressants in Amine Flotation of Iron Ore. C. S. Chang, S. R. B. Cooke and R. O. Huch. *Mining Engineering,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 196, Dec. 1953, p. 1282-1286.
Includes graphs, tables, photograph. 7 ref. (B14)

60-D. (Russian.) **Kinetics of the Low-Temperature Reduction of Iron Ores. Reduction of Artificial and Natural Iron Ores by Hydrogen.** S. T. Rostovtsev and A. P. Em. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 329-332.
For the investigation rich Krivoi Rog ore was used. No essential difference was noted in the reduction kinetics between Krivoi Rog ore and chemically pure iron oxide. Graphs. 1 ref. (D1, Fe)

E
Foundry

24-E. Gating to Control Pouring Rate and Its Effect on the Casting. F. J. McDonald. *American Foundryman,* v. 24, Dec. 1953, p. 36-41.
Studies of effect of pouring rate on quality of cast iron castings. Diagrams, photographs, tables. (E23, CI)

25-E. Catalytic Combustion Control in Core-Baking Oven. R. J. Ruff. *American Foundryman,* v. 24, Dec. 1953, p. 42-44.
Catalytic element and its use in flameless low-temperature burning of oil vapors. Graphs, photographs. (E21)

26-E. Factors Influencing Riser Range and Feeding Adequacy. II. William S. Pellini. *American Foundryman,* v. 24, Dec. 1953, p. 62-71.
Summarizes studies on solidification of castings and riser action. Graphs, diagrams. 19 ref. (E23, E25, CI)

27-E. Foundry Practice. V. Moulding and Coremaking. William H. Salmon and Eric N. Simons. *Edgar Allen News,* v. 32, Nov. 1953, p. 255-256.
Mold-making machines. Diagrams. (To be continued.) (E19)

28-E. How to Avoid Trouble in the Aluminum Foundry. Donald L. LaVelle. *Foundry,* v. 81, Dec. 1953, p. 102-106, 259-267.
Cause and prevention of defects due to molding and pouring practices. Photographs. (E19, E23, Al)

29-E. How Temperature and Pouring Rate Effect Solidification of Bronze. Harold J. Roast. *Foundry,* v. 81, Dec. 1953, p. 107.
Methods of avoiding porosity in castings. (E25, Cu)

30-E. Use of Shell Cores in Casting Air-Cooled Engines. John L. Schmieder. *Foundry,* v. 81, Dec. 1953, p. 114-117.
Fabrication of hollow cores. Photographs. (E21)

31-E. Patternmaking for the Repetition Foundry. Robert R. Shaw. *Foundry Trade Journal,* v. 95, Nov. 26, 1953, p. 645-649.
Condensed text of paper presented before meeting of Institute of British Foundrymen. Various techniques necessary for different types of casting. Diagrams, photographs. (E17)

32-E. Simplified Moulding. "Jacques". *Foundry Trade Journal,* v. 95, Nov. 26, 1953, p. 661-664.
Advantages obtained from close cooperation of design department and molding shop. Diagrams. (E19)

33-E. The Oxidation of Aluminium-Magnesium Alloys by Steam: a Contribution of Research on Mould Reaction. Marjorie Whitaker. **The Constitution of Oxide Films Formed at High Temperature on Aluminium-Magnesium-Beryllium Alloys.** A. R. Heath. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 107-116.
Research on methods of preventing the reaction between aluminum-10% magnesium alloy and steam atmosphere generated in a sand mold. Graphs, tables. 15 ref. (E19, Al, Mg)

34-E. Flow Properties of Foundry Sand. J. Gittus. *Iron & Steel,* v. 26, Dec. 1953, p. 551-553.
Effect of flow properties on mold fabrication. Interprets common terminology in terms of bond energy ratio. Photographs. 13 ref. (E18)

35-E. Electric Steel Foundries Control Dust Emissions in Los Angeles Area. O. E. Erickson. *Journal of Metals,* v. 5, Dec. 1953, p. 1625-1626.
Various types of dust collectors. Tube-type bag filter using Orlon bags has been most successful. Table. (E general, A8, CI)

36-E. Copper Castings. J. B. McIntyre. *Machinery,* v. 83, Nov. 13, 1953, p. 959-962.
Melting equipment, deoxidants and pouring procedures. Graphs. (E general, Cu)

37-E. Quality in Light Metal Castings. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 115-116.
Dangers of lowering standards of quality and service in an attempt to fill increasing orders. (E general, EG-a)

38-E. Oblique Withdrawal and Ejection From Die Casting Dies. L. C. Barton and E. N. Field. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1061-1068.
Factors affecting design of tool; advantages, limitations and applications of technique. (E13)

39-E. Shell Moulds for Magnesium Castings. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1069-1070.
Techniques employed and problems encountered in process. (E16, Mg)

40-E. Centrifugal Casting. New Foundry for Millspaugh Limited at Sheffield. *Metal Industry,* v. 83, Nov. 13, 1953, p. 397-399.
Equipment and plant layout. Photographs. (E14)

41-E. Gunmetal Pressure Test Failures. *Metal Industry,* v. 83, Nov. 20, 1953, p. 420.
Porosity defects in gunmetal castings and corrective measures. Photographs. (E25, Cu)

42-E. Metal Casting Methods. VIII. Gating and Feeding Practice. J. B.

McIntyre. *Metallurgia*, v. 48, no. 289, Nov. 1953, p. 241-246.

Gating and feeding of sand casting and use of chills. Brief reference to jobbing and mechanized molding. Photographs, diagrams. (E22, E23)

43-E. Magnesium Jet Engine Castings Made Pressure-Tight by Vacuum Impregnation. *Modern Metals*, v. 9, Nov. 1953, p. 50.

Impregnation with a thermosetting resin. Photograph. (E25, Mg)

44-E. (French.) **Lubrication and Casting of Tools in Pressure Casting.** R. Grunberg. *Métallurgie et la construction mecanique*, v. 85, no. 11, Nov. 1953, p. 869, 871-872.

Qualities of an ideal lubricant to assure both protection of the surface of the cavity and good lubrication of the moving die components. Properties of silicones. Application of lubricants on the mold. Photographs. (E13)

45-E. All-Electric Operation Features Modern Permanent Magnet Foundry. Robert H. Herrmann. *Foundry*, v. 82, Jan. 1954, p. 86-91, 206, 208, 210, 212.

Equipment, plant layout and operating procedures. Diagram, photographs, tables. (E general)

46-E. Sand Castings Can Be Made to Close Tolerances. Lewis B. Reed. *Foundry*, v. 82, Jan. 1954, p. 92-97, 235-236.

Production of intricate aluminum and magnesium parts with high degree of dimensional accuracy. Photographs. (E19, Al, Mg)

47-E. Several Factors Influence Linear Shrinkage. Hubert Chappie. *Foundry*, v. 82, Jan. 1954, p. 100-103.

How various factors prevent establishment of fixed rule to cover shrinkage of other than small light parts. Photographs. (E25, P10)

48-E. Foundry Data Sheet. Formulas for Determining Weights of Castings. *Foundry*, v. 82, Jan. 1954, p. 173-174.

Data sheet. (To be continued.) (E25)

49-E. Shell Moulding of Cylinder Castings. A. Emmerson. *Foundry Trade Journal*, v. 95, Dec. 3, 1953, p. 687-696.

Pattern materials, cores, methods of reinforcing shells and pouring procedures. Photographs. (E16, CI)

50-E. Zircon Sand. M. R. Hinchcliffe. *Metal Industry*, v. 83, Nov. 27, 1953, p. 437-440.

Merits as a core material for severe casting conditions. Graphs, photographs, diagram. 9 ref. (E18)

51-E. Quality Control in the Production of Wrought Aluminum Alloys. R. T. Staples and J. Hurst. *Metal Progress*, v. 65, Jan. 1954, p. 136, 138, 140, 142.

Previously abstracted from the original in *Journal, Institute of Metals*. See item 186-E, 1953. (E10, S general, Al)

52-E. (French.) **Pressure Casting.** Robert Girard. *Métallurgie et la construction mécanique*, v. 85, no. 10, Oct. 1953, p. 787, 789.

Advantages and application of method. Diagrams. (E13)

53-E. (French.) **The Cupola Furnace and the Superheating of the Cast Metal.** J. Pascal. *Métallurgie et la construction mécanique*, v. 85, no. 10, Oct. 1953, p. 779, 781, 783-784.

Superheating by means of oxygen-enriched blast. Theoretical basis for the problem including an outline of thermal balance. Graphs, tables. 39 ref. (E10)

54-E. (German.) **Efficiency of Coreless Low-Frequency Crucible Induction Furnaces for Gray Iron.** F. Deutz. *Giesserei*, v. 40, no. 23, Nov. 12, 1953, p. 609-614.

Current consumption and efficiency of 1.5, 3, and 6-ton furnaces from three typical foundries. Advantages of the coreless furnace. Tables, graphs, photographs. (E10, CI)

55-E. (Spanish.) **Directed Segregation in Cast Iron.** José M. Sistiaga. *Ciencia y técnica de la Soldadura*, v. 111, no. 14, Sept.-Oct. 1953, 4 p.

Identification, origin and mechanism of segregations. Micrographs. (E25, CI)

56-E. (Swedish.) **Systematizing Machine Molding of Small Castings.** E. O. Lissell. *Gjuteriet*, v. 43, no. 9, Sept. 1953, p. 159-163.

Properties of molding sand. Molding with stationary and portable machines compared. Photographs, diagrams. (E18, E19)

57-E. (Swedish.) **Experiments With Different Types of Feeders.** Bertil Thyberg. *Gjuteriet*, v. 43, no. 10, Oct. 1953, p. 175-181.

Design and operation of new type pouring cup for casting malleable iron. Diagrams, micrographs, photographs. (E23, Fe)

58-E. (Swedish.) **Exchangeable Pattern Plates in Frames.** Henry A. Nilsson. *Gjuteriet*, v. 43, no. 10, Oct. 1953, p. 182-184.

Difficulties of producing small castings economically in mechanized foundry. Photographs, table. (E17)

59-E. Modern Swiss Foundry Incorporates Automatic Controls. Victor Frey. *Foundry*, v. 82, Jan. 1954, p. 104-109.

Equipment, plant layout and operating procedures. Diagram, photographs. (E general)

60-E. A B C of Foundry Practice. II. Core Blowing Equipment and Use. Pat Dwyer. *Foundry*, v. 82, Jan. 1954, p. 168, 171.

Principles and techniques of process of two manufacturers. Diagrams. (E21)

61-E. Plaster Moulded Aluminium Patterns. *Light Metals*, v. 16, Dec. 1953, p. 396-397.

Advantages of plaster molding and production of the patterns. Photographs. (E16, E17, Al)

62-E. (French.) **Desulfurization Conditions in the Hot-Blast Cupola.** Marcel Guédras. *Métallurgie et la construction mécanique*, v. 85, no. 11, Nov. 1953, p. 863, 865, 867.

Advantage of using magnesium liquid slags. Presence of pure dolomite when operating at 500 to 600° C. assures production of high-quality melt. 5 ref. (E10, CI)

63-E. (Hungarian.) **Theory and Practical Application of High-Speed Casting.** Miklos Csiszar. *Öntöde*, v. 4, no. 9, Sept., p. 189-196.

New high-speed casting method based on filling the mold fast enough so temperature is nearly equal in all parts of the mold. Air and gas conduction is modified in a manner that prevents the gases from getting into the mold. Details of the process. Graphs, tables, diagrams. (E19)

64-E. (Book.—German.) **(A Comprehensive Treatise on Metal Founding.) Das Giessereiwesen in gemeinfasslicher Darstellung.** H. Schmidt. Ed. 3. 349 p. 1953. Giesserei Verlag, Dusseldorf, Germany. 24 D.M.

A joint effort of three foundrymen's associations and 18 collaborators. A condensed encyclopedia dealing with every phase of foundry work from early history to finished modern castings. Includes making of patterns; materials, manufacture and drying of molds and cores; molders' tools; fuels used in the foundry; raw materials for iron and steel, nonferrous and light metals; melting furnaces; calculation of composition of charge; preparation of molds and pouring methods; cleaning of castings; heat treatment and improvement of surfaces; properties and methods of testing; defects; arrangement and floorspace of foundries; heat and power requirements; costs. Not written for experts, but for those who wish to become experts. W. Trinks. (E general)

65-E. (Book—German.) **(Course of Fundamental Instruction for Molders.) Grundlehrgang für Former.** Dellwig and Esch. 89 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 5.60 D.M.

A three months' course of instruction for apprentices, explaining every step in the molding operation in detail. W. Trinks. (E19)

66-E. (Book—German.) **(Defects in Castings.) Fehlererscheinungen an Guss-Stücken.** E. Knipp. 261 p. 1953. Giesserei Verlag, Dusseldorf, Germany, 26 D.M.

Deals with pipes, cavities, blowholes, nonmetallic inclusions, sand-filled depressions, burnt-in sand, incomplete filling of mold, segregations, cracks and warping. Causes and prevention in cast iron, malleable, steel castings, heavy nonferrous metals and light metals. Widely differing treatment is needed for prevention of defects in different metals. Probably the only comprehensive treatise on this subject in book form. 280 ref. W. Trinks. (E25)

67-E. (Book.) **The Foseco Foundryman's Handbook.** 231 p. Foundry Services, Long Acre, Nechells, Birmingham, England. 7s. 6d.

Discusses light casting alloys, nonferrous casting alloys, iron castings, and die casting. Tables. (E general)

68-E. (Book—German.) **(What Every Coremaker Must Know About His Job.) Was jeder Kernmacher von seiner Arbeit Wissen Muss.** C. Pfannenschmidt. 70 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 3.60 D.M.

Course of apprentice training for specialized operations. What to watch for and what will happen under concrete conditions. Instructors will find valuable. W. Trinks. (E21)

69-E. (Book—German.) **(What Every Molding Machine Operator Must Know About His Job.) Was jeder Maschinenformer von Seiner Arbeit Wissen Muss.** H. Gries. 64 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 3.20 D.M.

Course of apprentice training for specialized operations. What to watch for, and what will happen under concrete conditions. Instructors will find valuable material for improving their courses. W. Trinks. (E19)

F

Primary Mechanical Working

29-F. The Computation of Loads in Metal Strip Rolling by Methods Involving the Use of Dimensional Analysis. Maurice Cook and R. J. Parker. *Institute of Metals, Journal*, v. 82, Nov. 1953, p. 129-140.

Calculated load values were found to be in good agreement with measured results for conditions where ratio of initial strip thickness to roll diameter was greater than about 1:200, but when the ratio was less than this value computed data were not so accurate. Graphs, diagrams, tables. 11 ref. (F23)

30-F. Forged Tools. *Iron & Steel,* v. 26, Dec. 1953, p. 545-550.
Rolling mills, forges and heat treating facilities for making forks, shovels and axes. Photographs, diagrams. (F23, F22, J general)

31-F. Flying Shears for Billet, Bar and Rod Mills. J. H. Hitchcock and E. S. Murrah. *Iron and Steel Engineers,* v. 30, Nov. 1953, p. 80-87; disc., p. 87-90.
Types, operation and performance. Photographs, graphs. 5 ref. (F29)

32-F. Low Frequency Induction Coils Shorten Billet Heating Time. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 130, 132.
Experimental furnace and its operation. Photographs. (F21, ST)

33-F. Blooming Mill Built for Detroit Steel. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 140, 144, 146, 150.
Two-high, reversing, high-lift 44x 110-in. slab blooming mill. Photographs. (F23, ST)

34-F. Versatile Hot Rod Mill. *Metal Industry,* v. 83, Nov. 20, 1953, p. 417-419.
Installation designed to roll wide variety of alloys. Photographs, diagrams. (F23)

35-F. Hot Rolling of Steel Strip. Planetary Mill Installed at Willenhall. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 247-248.
Equipment, plant layout and operating procedures. Diagrams, photographs. (F23, CN)

36-F. Mechanical Working. I. Co-Operative Research in Metal Working. W. C. F. Hessenberg. II. Roll Force Measurement and Automatic Gauge Control. W. C. F. Hessenberg. III. The Study of High-Speed Wire Drawing. Problems of Heat Lubrication. J. G. Wistreich. IV. Some Aspects of Theoretical Plasticity. A. P. Green. V. Forging Research. Use of Plasticine Models. P. M. Cook. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 525-550.
Developments in research conducted by the BISRA. Graphs, diagrams, photographs. 26 ref. (F general, A9)

37-F. Britain's Biggest Aluminum Fabricator. *Modern Metals,* v. 9, Nov. 1953, p. 72-74, 76, 78, 80, 82.
A general description of facilities of the Aluminum Co. of Canada, Ltd. Includes furnace installations, foundries, forging operations, sheet mills, rolling mills, extrusion operations, and powder production. Photographs.
(F general, C general, H general, Al)

38-F. Bar Mill Built to Serve Market. Allen G. Gray. *Steel,* v. 133, Dec. 7, 1953, p. 196-197, 199.
Mill for cold drawing of bars. Photographs, plant layout, diagram. (F27, ST)

39-F. German Research in Drop Forging. Otto Kienzle. *Steel Processing,* v. 39, Nov. 1953, p. 563-568.
Equipment, tolerances and wear. Photographs, diagrams, graphs. (F22)

40-F. Steam-Hydraulic vs. Hydraulic Forging Press. Victor Tatarinov. *Steel Processing,* v. 39, Nov. 1953, p. 581.
Compares efficiency of two 600-ton presses. (F22)

41-F. Forging Capacity of Hammers. K. Lange. *Steel Processing,* v. 39, Nov. 1953, p. 594-596.
Experiments to determine accuracy with which forging capacity of hammers can be estimated by the upsetting of lead cylinders. Graphs, photograph. 2 ref. (F22)

42-F. (French.) The "Aptitude to Swaging" of Sheet Metal. I. A New Swaging Test. The "P. V. I." Test. Its Relation With the Rational Traction Test. Pierre Vauthier. *Metaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 437-459.
Includes tables, graphs, diagrams. (F25)

43-F. (German.) The Determination of Rolling Time for Different Steel Grades as a Basis for Reference Ton Accounting in the Rolling Mill by Means of an Automatic Recording Instrument. Friedrich Bleimann. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1468-1472.
Use for compilation of steel grades according to rolling difficulties. Photographs, tables, graphs. (F23, ST)

44-F. (Russian.) The Phenomenon of Spontaneous Appearance of Facets on Wires of Polycrystalline Metals During Stretching. P. D. Novokreshchenov. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 123-124.
Importance in wiredrawing especially at temperatures near recrystallization point. Table, graph. (F28, Cu, Zn, Cd, Sn)

45-F. (Swedish.) Development Trends in Forging Technique. I. Heavy Forging by Hammers and Presses. J. M. Schenström. **II. Drop Forging.** Bengt Lagercrantz. *Jernkontorets Annaler,* v. 137, no. 9, 1953, p. 455-611; disc., p. 612-616.
Theory of plastic deformation under pressure. Operations, equipment and tools. Tables, graphs, diagrams, photographs. 105 ref.
(F22, Q24, CN, Si, Mn, Cr, Ni, Mo, W, V)

46-F. (Swedish.) Steel Conditioning With the Oxy-Acetylene Method. Gösta Kihlgren. *Jernkontorets Annaler,* v. 137, no. 9, 1953, p. 617-700; disc., p. 700-701.
Hand scarfing of billets with oxy-acetylene flame and powder scarfing method for high alloy steels. Tables, graphs, diagrams. (F21, AY)

47-F. Electrical Drive of 14-In. Reversing Cold Strip Mill. *Engineer,* v. 196, Dec. 4, 1953, p. 728-730.
Electrical equipment for laboratory rolling mill used for study of variables such as speed, tension and gage control. Photograph, circuit diagram. (F23)

48-F. A Modern Automatic Fuel Shut-Off System for Soaking Pits. A. L. Lancaster. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 69-76; disc., p. 76.
Position of furnace covers or doors controls firing conditions in furnace pits. Photograph, diagrams. (F21)

49-F. Speed Regulation for Tandem Tube Mill Drives. F. H. Wickline. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 84-86.
Successful applications of electronic controls in the steel industry. Photograph, diagrams, graphs. (F26)

50-F. The Story of Wire. Rodman R. Tatnall. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 129-134.
Equipment and techniques employed in wire processing. Outline of its applications. Diagram, photographs. (F28)

51-F. The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill. Eustace C. Larke. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1081-1091.
Includes graphs, diagrams, photographs. 33 ref. (To be continued.) (F23)

52-F. Coating Paves Way for Drawing Speedup. *Steel,* v. 133, Dec. 21, 1953, p. 82-83.
By replacing conventional lime coating practice with a dry, thin-film lubricant, one plant tripled production with 3-die draw benches. Photograph, tables. (F28, F1)

53-F. (Russian.) Investigation of the Nature of Deformation During Free Upsetting and Upsetting in Forms. L. N. Moguchii. *Izvestiia Akademii Nauk SSSR, Otdelenie, Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1475-1479 + 1 plate.
Forms were found to increase the nonuniformity of deformation and to decrease plasticity of the forging. Deformability was increased if negative hydrostatic stress was developed in the blank. Table, graph, photographs. 3 ref. (F22, Al)

54-F. How Kaiser Aluminum Extrudes Aluminum Shapes. *Industrial Gas,* v. 32, Dec. 1953, p. 4-5.
Equipment, plant layout and operating procedures. Photographs. (F24, Al)

55-F. Britain's Biggest Aluminum Fabricator. II. *Modern Metals,* v. 9, Dec. 1953, p. 35-36, 38, 40, 42, 44.
Facilities and operations of Northern Aluminum Co., England, including bar mills, wire drawing equipment, rolling mills and scrap reclaiming plant. British applications of aluminum in aircraft, automobiles, containers and ships. Photographs.
(F general, T24, T21, T22, T10, Al)

56-F. Tolerances in Drop Forging. Otto Kienzle. *Steel Processing,* v. 39, Dec. 1953, p. 654-658, 667.
Factors to be considered in determining tolerances. Diagrams, graphs. (F22)

57-F. "Hot Squeeze". Extrusion of Alloy Steel Shapes Perfected by Harvey, Cuts Machining Costs. *Western Metals,* v. 11, Dec. 1953, p. 44-46.
Development and advantages of process. Photographs. (F24, AY)

58-F. Electric Motors and Control for Slip Type Wire Drawing Machines. H. A. Dickerson. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1295-1304, 1334-1337, 1339, 1341, 1343.
Motors and controls used in drawing copper wire for electrical conductors. Graphs, diagrams, photographs. (F28, Cu)

59-F. How Cold Reduction Affects Several Properties of 18-8 Stainless Steel Wire. Samuel Storchheim. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1310-1311, 1314.
Results of experimental studies. Tables, graphs. 2 ref.
(F28, Q general, SS)

G
Secondary Mechanical Working

18-G. Die Life Is up 18 Times With Ductile-Iron Dies. J. C. Neemes, Jr. *American Machinist,* v. 97, Dec. 7, 1953, p. 134-135.
Composition, applications and advantages of ductile iron dies for operations on brass cartridge cases. (G1, T5, CI, Cu)

19-G. An Evaluation of Spinning vs. Drawing Relates the Methods. J. Lengbridge. *Canadian Metals,* v. 16, Nov. 1953, p. 36, 38, 40.
An evaluation of spinning and drawing shows they can compete as well as supplement each other according to the economics involved in individual cases. Diagrams. (G13, G4)

20-G. Using Tungsten Carbide Tools. *Edgar Allen News,* v. 32, Nov. 1953, p. 241-243.
Shapes, grades, selection and methods of brazing carbide tools. Diagrams. (To be concluded.) (G17, K8)

21-G. Pressure. Versatile Equipment Broadens Work Range. John E. Hyler. *Iron Age,* v. 172, Dec. 3, 1953, p. 168-171.

Hydraulic presses which handle a wide variety of assembly jobs by fitting, crimping, riveting, staking and other pressure methods. Photographs. (G1)

22-G. Improved Chuck Speeds Machining of Brass Parts. Dale Stoneman. *Iron Age,* v. 172, Dec. 3, 1953, p. 177-179.

Reductions in machine-handling and work-handling times through use of an improved chucking device have substantially reduced over-all time per piece in machining brass pipe fittings. Photographs. (G17, Cu)

23-G. The Critical Rake Angle Method of Evaluating Cutting Fluids. W. E. Lauterbach and E. A. Ratzel. *Lubrication Engineering,* v. 9, Dec. 1953, p. 313-315.

Results of experimental studies conducted to show applications and limitations of this method. Tables, graph, photographs. (G21)

24-G. Producing Tubing Assemblies for Airplane Engines. *Machinery,* v. 60, Dec. 1953, p. 175-179.

Fabricating assemblies of seamless steel tubing and forged fittings for oil, fuel and exhaust lines. Bending, machining and welding operations. Photographs. (G6, G17, K general)

25-G. When and How to Use Carbides in Machining Stainless Steel. G. J. Stevens. *Machinery,* v. 60, Dec. 1953, p. 196-200.

Includes diagrams. (G17)

26-G. Making Hollow Steel Propeller Blades. Methods Employed at the Hatfield Factory of de Havilland Propellers, Ltd. *Machinery (London),* v. 83, Nov. 13, 1953, p. 939-947.

Forming operations. Photographs. (G general, AY)

27-G. Machining—Theory and Practice. K. G. Lewis and W. Milne. *Machinery (London),* v. 83, Nov. 20, 1953, p. 1007-1013.

Machinability, tool life, types of tool failure and work handling. Graphs, tables. 24 ref. (G17)

28-G. Finish Rolling Cast Iron Guiding Surfaces for Machine Tools. W. Iwascheff. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1058-1060.

Technique, applications and advantages of finishing previously machined cast iron guideways or bearing surfaces by pressure rolling. Photographs, graphs, table. (G19, CI)

29-G. The Corrosive Properties of Soluble Cutting Oils. Effect on Machine Tool Cast Irons. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 233-240.

Studies on the influence of cutting oils on efficiency of machining operations. Photographs, tables, graphs. (G21, G17, R7)

30-G. The Problem of Dry Friction in Chip Forming Machining. E. Bickel. *Microtecnic (English Ed.),* v. 7, no. 5, 1953, p. 243-245.

Causes of wear including plastic deformation, brittle fracture and wear produced by chip sliding along face of cutting edge. 9 ref. (G17, Q9)

31-G. Hydro-Press High-Pressure Cylinder Development. Don R. Maynard. *Modern Machine Shop,* v. 26, Dec. 1953, p. 152-154, 156, 158, 160.

Cylindrical containers for high-pressure rubber forming tools. Photographs, diagrams. (G8)

32-G. Hot Forming Titanium. *Modern Metals,* v. 9, Nov. 1953, p. 88, 90.

Methods of press forming titanium sheet. Photographs. (G1, Ti)

33-G. What About Your Safety Program? Harry Chandler. *Steel,* v. 133, Nov. 30, 1953, p. 101-104.

Safety equipment and procedures in a stamping plant. Photographs. (G3, A7)

34-G. How to Get the Most From Carbide Tools. Edward J. Novack. *Tool Engineer,* v. 31, Dec. 1953, p. 37-43.

Selection, design, performance, maintenance and inspection of tools. Diagrams, photographs. (G17)

35-G. Finish Rolling Improves Cast Iron Ways. Wackch Iwascheff. *Tool Engineer,* v. 31, Dec. 1953, p. 57-59.

Tools and procedures for cold rolling cast iron machine tool ways. Diagram, micrograph, table. (G11)

36-G. Magnesium Forming. II. Hot Drop Hammer Forming and Sheet Stretching. Francis L. Coenen. *Tool Engineer,* v. 31, Dec. 1953, p. 62-68.

Die design and operating procedures. Diagram, photographs, table. (G9, F22, Mg)

37-G. Machining Stainless Steels. *Tool Engineer,* v. 31, Dec. 1953, p. 81-84.

Tools and machining speeds for the less machinable grades. Tables. (G17, SS)

38-G. (French.) **Mechanism of the Formation of the Arrest Reported During the Cutting of Metals.** Paul Bastien and Michel Weisz. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 871-873.

Investigation of low-alloy steel. Causes for phenomenon indicated and interpreted. Graph, micrograph. 2 ref. (G17, AY)

39-G. (French.) **Conditions of Stability of the Built-Up Edge in Phenomena of Metal Cutting.** Paul Bastien and Michel Weisz. *Comptes rendus,* v. 237, no. 17, Oct. 28, 1953, p. 968-970.

Stability as a function of cutting temperature and resulting effect on surface finish. Graphs, micrographs. (G17)

40-G. (French.) **Machinability of Stainless Steel.** Jean Daurat. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 885, 887.

Lubrication during machining. Types of lubricating oils, temperature of cooling oils, cleaning of pieces, cleanliness of the lubricant and importance of spraying apparatus. Diagrams. (G17, G21, SS)

41-G. (Russian.) **Theoretical Equation of the Cutting Force.** A. M. Rozenberg and A. N. Eremin. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 55-59.

Experimental testing carried out on several steels. Graphs. 6 ref. (G17, ST)

42-G. (Russian.) **Reproducibility and Productivity of Electrospark Machining.** S. A. Kipnis. *Vestnik Mashinostroeniia,* v. 35, no. 8, Aug. 1953, p. 59-66.

Theoretical study of relationship of wear in the instrument and corresponding wear of the processed part. Tables, diagrams. 7 ref. (G17, Q9)

43-G. Bending Structural Sections. K. Gunn and D. F. Michell. *Aircraft Production,* v. 15, Dec. 1953, p. 444-450.

Review of techniques for forming high-strength aluminum alloys. Photographs, graphs. 4 ref. (G6, Al)

44-G. Thread-Rolling. New Attachment for Use on Standard Production-Type Machines. *Aircraft Production,* v. 15, Dec. 1953, p. 482.

Rollrite self-opening thread-rolling die-head, designed for use on machines such as capstan and turret-lathes and drilling-machines. Photograph. (G12)

45-G. Pass Design and Rolling of Automotive Rim Sections. Howard H. Morgan. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 55-60; disc., p. 60, 61.

Techniques and equipment employed in continuous rolling of intricate shapes requiring exacting tolerances. Diagrams, table. (G11)

46-G. (Russian.) **Influence of Water and Alcohol on the Grinding of Metals.** V. D. Kuznetsov and V. D. Taranenko. *Doklady Akademii Nauk SSSR,* v. 92, no. 1, Sept. 1, 1953, p. 49-52.

Results of experiments with abrasive grinding of aluminum, copper and zinc in air, water and ethyl alcohol do not agree with results of other investigations. Tables, diagram. 2 ref. (G18, Al, Cu, Zn)

47-G. Cut Finishing Time 2/3 on 120-MM. Powder Chambers. Anderson Ashburn. *American Machinist,* v. 97, Dec. 21, 1953, p. 100-101.

Tracer-controlled grinders have been taking over internal finishing of gun-tube powder chambers a size at a time. Photographs, diagrams. (G18, ST)

48-G. Improved Techniques Developed for Grinding Titanium Carbides. F. J. Lennon, Jr. *Iron Age,* v. 172, Dec. 17, 1953, p. 144-146.

Diamond wheels are recommended, but the more economical silicon carbide wheels may be used if wheel speeds are kept in the low 3500 to 4000 range of surface ft. per min. Photographs. (G18, Ti)

49-G. Improving the Fatigue Life of Springs by Liquid Honing. H. J. Steel. *Machinery (London),* v. 83, Dec. 4, 1953, p. 1083-1093.

Process of liquid honing, techniques of testing fatigue life and variables to be considered in treatment of springs. Photographs, micrographs, diagrams, tables, graphs. (G19)

50-G. Electro-Mechanical Methods for Machining and Grinding Cemented Carbides. *Machinery (London),* v. 83, Dec. 11, 1953, p. 1146-1148.

Equipment, techniques and advantages of process. Experimental studies to determine rate of grinding and wheel wear. Table. (G17, G18)

51-G. O.B.I. Press—An Ideal General Purpose Machine. Ernest C. Morse. *Modern Industrial Press,* v. 15, Dec. 1953, p. 22, 24, 26, 30, 32, 34.

Line of presses. Photographs. (G1)

52-G. "Design Leadership" Slogan at Seattle Plant of Square D Company. Howard E. Jackson. *Modern Industrial Press,* v. 15, Dec. 1953, p. 36, 38, 40, 42, 44, 46, 48, 68.

Facilities for fabrication of sheet metal products. Photographs. (G general, CN)

53-G. Selecting a Mechanical or Hydraulic Press for Your Particular Job. Len Crary. *Modern Industrial Press* v. 15, Dec. 1953, p. 50, 52, 54, 58, 60, 62, 64.

Working stroke and various draw problems, selecting the proper press in each case. Diagrams, table. (G1)

54-G. Pressure Vessel Fabrication in New Plant. Kenneth L. Walker. *Modern Machine Shop,* v. 26, Jan. 1954, p. 136-144, 146.

Giant size tools for forming, machining, welding and testing huge processing equipment. Photographs. (G general, K general, S general)

55-G. Relation of [Abrasive] Wear to the Grinding Area. G. D. Polosatkin. *National Science Foundation Translation,* no. 42, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 971.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

A continuation and extension of previous investigations of relation between abrasive wear and metal cutting. Graphs. 1 ref. (G18, Q9)

56-G. Metal Spinning, Its Implications, and Applications. Lester F. Spencer. *Steel Processing,* v. 39, Dec. 1953, p. 631-640.

Process, equipment requirements, materials, lubrication, techniques and other basic considerations. Photographs, graphs, diagrams, tables. 9 ref. (G13)

57-G. Finishing Intricate Castings. Russell H. Bennett. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 87-88.

Engineering has played a big factor in design of fixtures for machining of intricate aluminum castings at Hoover Electric Co. Photographs. (G17, Al)

58-G. Tooling Applications. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 108-109.

Cost-cutting applications of tungsten carbide milling cutters. Photographs, diagrams. (G17, W)

59-G. Titanium & Stainless Offer Knotty Problems in Abrasive Grinding. Fred A. Upper. *Western Metals,* v. 11, Dec. 1953, p. 68-69.

Grinding wheels, coolants and other factors. (G18, G21, Ti, SS)

60-G. Rod and Wire Quality vs. Cold Heading Quality. William E. Hill, Jr. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1291-1293, 1357-1359.

Improper uses to which cold heading rods and wire may be put that can result in unsatisfactory products. Photographs. (G10)

H
Powder Metallurgy

11-H. Cermets—Possible Answer to Ultra-High Temperatures. Alexander Pechman. *Finish,* v. 10, Dec. 1953, p. 37-38, 86, 88.

Production and properties of cermets. Applications of ceramic protective coatings in aircraft engines. Photograph, table. (H general, L27)

12-H. Design Trends of Powdered Iron Core Inductances as Used in the Electronics Industry. Bernard Goldsmith. *Metal Powder Association, Proceedings,* 1953, p. 14-21.

Electrical specifications, temperature coefficient and strength of cores. (H11, Fe)

13-H. Metal Powder Friction Materials in Heavy Duty Transmissions. J. E. Storer. *Metal Powder Association, Proceedings,* 1953, p. 49-59; disc., p. 59.

Tests and properties of different types of clutches. Photographs, graphs. (H general, Cu, ST)

14-H. Powder Metallurgy at the Cross Roads—Present and Future Possibilities. John D. Shaw and Walter V. Knopp. *Metal Powder Association, Proceedings,* 1953, p. 63-68.

Numerous factors having significant bearing on potentials of powder metallurgy. (H general)

15-H. Non-Metallic Impregnation of Sinterings. Wilson N. Pratt. *Metal Powder Association, Proceedings,* 1953, p. 78-80; disc., p. 80-82.

Important characteristics of synthetic resins for successful impregnation. Photograph, micrographs. (H16)

16-H. Review of Aluminum Powder Metallurgy. J. B. Haertlein and J. F. Sachse. *Metal Powder Association, Proceedings,* 1953, p. 83-92; disc., p. 92-94.

Aluminum powder manufacture, two important uses and art of fabrication. Tables, graph. (H general, Al, Fe)

17-H. Powdered Metals Enter Stainless Stage. W. L. Batten. *Steel,* v. 133, Dec. 21, 1953, p. 78-81.

Stainless steel powder production, applications, properties and outlook. Photograph, diagram, tables. (H general, SS)

18-H. (Hungarian.) **The Development of Aluminum Powder Metallurgy. III.** György Halmos. *Aluminium (Budapest),* v. 5, no. 8, Aug. 1953, p. 165-175.

Experiments in Hungary with aluminum powder and scrap aluminum powder. Results of various tests of hardness, heat resistance, cold forming, weldability, machinability and electric conductivity. Possibilities for application of sintered aluminum bodies. Photographs, micrographs, tables, graphs, diagrams. 37 ref. (H general, Al)

19-H. The Processing, in the Higher Density Range, of Durable, Precision Iron Powder Parts on a Production Basis. William J. Doelker and Harold T. Harrison. *Metal Powder Association, Proceedings,* 1953, p. 22-46; disc., p. 47.

Important characteristics of powders, physical properties, dimensional tolerances of parts and tool life. Graphs, diagrams, tables, micrographs. (H general, Fe)

J
Heat Treatment

21-J. Electric Spark-Hardening of Tools. L. Y. Popilov. *Engineers' Digest,* v. 14, Nov. 1953, p. 424-425. Translated from *Stanki i Instrument,* no. 5, 1953, p. 17-19.

Method and theory. Diagram, tables. (J2, TS)

22-J. Annealing or Softening Improves Gray Iron Machinability. Charles O. Burgess. *Foundry,* v. 81, Dec. 1953, p. 108-111, 250.

Mechanism of annealing and recommended annealing temperatures and times. Photographs, graphs, micrographs. 10 ref. (To be concluded.) (J23, G17, CI)

23-J. Heat Treatment of Steel Castings. John Howe Hall. *Foundry,* v. 81, Dec. 1953, p. 126-129, 194.

Jominy test and effect of quenching and tempering. Graphs, tables, micrographs. 10 ref. (J26, CI)

24-J. Integrated Heat Treating and Machining Setup Triples Production. A. A. Fisk. *Iron Age,* v. 172, Dec. 3, 1953, p. 174-176.

Equipment, plant layout and operating procedures. Photographs. (J general, G17)

25-J. Applying Electric Heat. Leo F. Spector. *Machine Design,* v. 25, Dec. 1953, p. 142-158.

Basic considerations in analysis, selection and application of built-in units for effective heat control. Graphs, photographs, tables. (J2)

26-J. Carbo-Nitriding and Gas Hardening. R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 70-73.

Method of hardening which combines advantages of carburizing and nitriding. Graphs, tables. (J28)

27-J. Bright Annealing. *Metal Industry,* v. 83, Nov. 20, 1953, p. 423-424.

Modern bell-type annealing furnace with heat recuperations. Photographs, diagrams. (J23)

28-J. (French.) **Nitrided Casting.** *Fonderie,* 1953, Oct., no. 93, p. 3655-3656.

Standards of casting compositions, thermic processes before nitriding and the nitriding process. Tables. 5 ref. (J28, AY, Cr, Al, Mo)

29-J. (German.) **The Work of an Induction-Hardening Plant.** K. Flick. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 31, Nov. 1, 1953, p. 1061-1065.

Process and advantages of induction hardening. Practical data and materials suitable for the process. Photographs, table, diagrams. 8 ref. (J2, Mn, Si, Cr, Mo, V)

30-J. (Hungarian.) **Metallographic Phenomena of Tempering and High-Speed Tempering.** Ferenc Boda. *Öntöde,* v. 4, no. 11, Nov. 1953, p. 238-243.

Investigations. Micrographs illustrate various structures. Tables. 9 ref. (J29, M27, CI, AY)

31-J. (Russian.) **Cold Hardening of Metal in a Static-Stressed State.** D. A. Sveshnikov and A. M. Tarasov. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 67-70.

Studies of residual stresses from compression and direct hardening of surface layers; importance of each. Graphs, photographs. 5 ref. (J26, Q25)

32-J. Annealing or Softening Improves Gray Iron Machinability. Charles O. Burgess. *Foundry,* v. 82, Jan. 1954, p. 110-113.

Methods of annealing and their effect on properties of gray iron. Photographs, tables, graphs. 7 ref. (J23, G17, CN)

33-J. Savings by the Tank Car. Paul E. Peacock, Jr. *Industry and Power,* v. 65, Dec. 1953, p. 64-69.

Bright annealing operation. Information and cost comparisons can be used for all applications which require equivalent amounts of ammonia. Photographs, tables, graphs. (J23)

34-J. Sinews for the Stratojets. S. G. Andrews and H. H. Smith. *Instrumentation,* v. 7, no. 1, 1953, p. 4-7.

Heat treating operations to insure desired tensile strength and corrosion resistance of aluminum alloy parts used in medium bombers. Photographs, micrographs. (J general, Q23, R general, Al)

35-J. Nitriding Critical Steel Parts. Ralph Spagnola. *Materials & Methods,* v. 38, Dec. 1953, p. 96-97.

Improvement of core strength by heat treatment and surface hardening by nitriding resulting in increased wear resistance, fatigue strength and bearing properties. Photographs. (J28)

36-J. Sulphurized Surfaces Resist Wear and Seizure. Bernard Jousset. *Metal Progress,* v. 65, Jan. 1954, p. 76-80.

Production of superior wear resistance on cast iron and steel engine parts by a heat treatment which adds a considerable amount of sulfur to the surface. Graphs, diagram. (J28, CI, CN)

37-J. Developments in German Constructional Steels to Conserve Scarce Alloys. F. W. Bruhl. *Metal Progress,* v. 65, Jan. 1954, p. 97-100.

Hardenability and machinability of carburizing and heat treating steels. Data on nickel-chromium, chromium-manganese and triple-alloy steels. Graphs, diagram, table. (J26, G17, AY)

38-J. (Czechoslovakian.) **Heat Treatment of Gears by the AC1 Surface Hardening Process.** F. Poboril. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 450-454.

Method consists of isothermic hardening of gears made from practically eutectic low alloy steels after heating in a salt bath. Tables, graphs. 4 ref. (J28, J2, AY)

39-J. (Czechoslovakian.) **Control of Heat Treatment in Large Forgings.** Stanislav Burda and Jaroslav Ruzicka. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 454-460 + 2 plates.

Methods of measuring temperatures and testing of the sample. Tables, graphs, photographs, diagrams. 7 ref. (J general, S16, ST)

40-J. (Czechoslovakian.) **Heat Treatment of Tool Steels.** Rudolf Stefec. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 461-464.

Principles and ways of preventing distortion. Effects of residual austenite content. Graphs. (J general, TS)

41-J. (Czechoslovakian.) **Treatment of Tool Steels Below Freezing Point.** Otakar Moravek. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 464-470.

Experimental results and possibility of using method for other steels. Table, graphs, photographs, micrographs. 7 ref. (J2, TS)

42-J. (Czechoslovakian.) **Induction Heating of Rolled Pieces.** Emil Langer. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 470-475.

Selection of suitable frequency and heating time. Diagrams, graphs, tables. 4 ref. (J2)

43-J. (French.) **Study of Some Low-Alloy Steels Quenched Normally and in Stages.** G. Delbart and F. Maratray. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 781-806.

Studies of specimens of Mn-Si, Cr-Mn-Si and Cr-V steels quenched in oil and tempered and quenched isothermally. Mechanical properties and Jominy hardenability of these steels compared with those of more highly alloyed Cr-Mo and Ni-Cr-Mo steels. Tables, graphs. 3 ref. (J26, Q general, AY)

44-J. (Hungarian.) **Gaseous Annealing of Malleable Castings.** Elek Chapo. *Ontöde,* v. 4, no. 8, Aug. 1953, p. 165-170.

Various reactions involved in annealing white cast iron. Effect of gas atmosphere upon decarburation and graphitization, influence of hydrogen in furnace atmosphere and effect of manganese-sulfur ratio of iron upon annealing rate. Table, graphs. (To be continued.) (J23, CI)

45-J. Automatic Furnace Line for Heat Treating Aircraft Screws. *Automotive Industries,* v. 109, Dec. 15, 1953, p. 39, 132.

Equipment, plant layout and operating procedures. Photographs. (J general)

46-J. Continuous Carburizing and Hardening of Pinions and Gears at Ford. *Industrial Heating,* v. 20, Dec. 1953, p. 2370-2372, 2374-2376, 2378.

Continuous furnace and quenching, annealing, and stress relieving operations. Photographs. (J28, J23, J1, ST)

47-J. An Evaluation of the Hardening Power of Quenching Media for Steel. III. Earl J. Eckel, Ross M. Mayfield, Glen W. Wensch and F. A. Rough. *Industrial Heating,* v. 20, Dec. 1953, p. 2392, 2394, 2396, 2398, 2518.

Results for an adaptation of the end-quench test to still-quenching conditions using oil and brine. Photograph, diagrams, graphs. (J2, J26, ST)

48-J. Continuous Heat Treatment of Non-Ferrous Strip by Transverse Flux Induction Heating. I. Robert M. Baker. *Industrial Heating,* v. 20, Dec. 1953, p. 2402, 2404, 2406, 2408, 2410, 2412.

Method and its advantages over longitudinal flux heating. Diagrams. (To be continued.) (J2, EG-a)

49-J. How to Determine Quenching-Distortion Properties. J. E. Campbell and H. O. McIntire. *Iron Age,* v. 172, Dec. 17, 1953, p. 140-143.

Favorable stresses improve fatigue life. The greater the stresses the more the distortion. Water quenching produces higher stresses and more warpage than oil. Minimum distortion is obtained on steels with just enough hardenability to harden through. Graphs, diagram, tables, photograph. (J26, Q7, ST)

50-J. Heat Treatment of Aluminum Casting Alloys. H. J. Rowe and W. E. Sicha. *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 2-5, 34, 37.

Furnaces, temperature control, annealing, precipitation hardening and aging. Micrographs, tables, graphs. 9 ref. (J general, Al)

51-J. Conveyorized Hardening Furnaces. A. J. Jarema. *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 6-7, 30.

Equipment, plant layout and operating procedures. Photographs, diagram. (J26)

52-J. Pusher-Chain Conveyor Combined in Semi-Continuous Production Unit. H. N. Ipsen. *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 8-9.

Semi-continuous, controlled atmosphere heat treating furnace. Diagram, photograph. (J general)

53-J. Machined Parts and Their Dimensional Control in Heat Treatment. I. H. Boyer. *Modern Machine Shop,* v. 26, Jan. 1954, p. 120-129.

Methods of minimizing distortion and volume changes in steel. Sketches, micrographs. (To be concluded.) (J general, P10, ST)

54-J. Andrew Laing Lecture. Internal Stresses in Some Types of Forging. C. Sykes. *North East Coast Institution of Engineers & Shipbuilders, Transactions,* v. 70, Dec. 1953, p. 61-92.

Considerations in selection of heat treatment cycles to produce shaft forgings. Tables, diagrams, graphs. 12 ref. (J1, F22, CN, AY)

55-J. Inside Look at Hardening Cast Iron. John Obrebski. *Steel,* v. 133, Dec. 28, 1953, p. 71-73.

Hardenability of cast iron depends on analysis, structure, and as-cast hardness plus stability of pearlite. For high quality, watch these and the heat treat process. Micrographs, photograph. (J26, CI)

56-J. Continuous Annealing With Carbon Restoration of Coils and Bars. J. D. Armour. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1305-1309, 1359.

Methods of annealing with prepared atmospheres and carbon restoration. Photographs, micrographs, graph. (J23)

57-J. (Hungarian.) **Annealing in a Gaseous Atmosphere. II.** Elek Chapo. *Ontöde,* v. 4, no. 9, Sept., p. 185-189.

Structure and operation of annealing furnaces. Advantages of annealing in a gaseous atmosphere. Diagrams, table. 9 ref. (J23)

58-J. (Book.) **Electric Resistance Heating.** 182 p. British Electrical Development Association, 2, Savoy Hill, London W.S. 2, England. 8s. 6d.

Advantages offered by electric heating, fundamental principles, and control methods. Resistance furnaces, salt baths, and ovens. Soft-metal melting, liquid heating, platen heating, steam raising, and miscellaneous applications such as soldering and air heating. (J2, E10, K7)

K

Joining

45-K. Modern Welding Technique. XX. Miscellaneous Non-Ferrous Alloys. E. T. Gill and Eric N. Simons. *Edgar Allen News,* v. 32, Nov. 1953, p. 253-254.

Methods of welding nickel, nickel alloys, magnesium and magnesium alloys. Tables. (To be continued.) (K general, Mg, Ni)

46-K. Fully Automatic Production of Resistance-Welded Wire Mesh. H. Wedl. *Engineers' Digest,* v. 14, Nov. 1953, p. 417-419. Translated from *Draht (German Ed.),* June, 1953, p. 205-211.

Design and construction of automatic equipment which includes automatic feeds to and from the machine. Graphs, diagrams. (K3, CN)

47-K. Welding Research in British Merchant Shipbuilding. R. B. Shepheard. *Engineering,* v. 176, Nov. 13, 1953, p. 639.

Notch properties and tests. (K general, Q23, ST)

48-K. Thermit Welding of Rolling Mill Pinions. John C. Querido, Jr. *Engineering Journal,* v. 36, Nov. 1953, p. 1468-1471.

Thermit welding theory. Process of welding new wobbler ends on drive pinions. Safety precautions. Photographs, tables. (K4)

49-K. Training Pipe Welders. R. D. Berry. *Heating, Piping & Air Conditioning,* v. 25, Dec. 1953, p. 94-96.

Journeymen pipefitters learn welding under program developed through cooperation for benefit of entire piping industry. Photographs. (K general, A6)

50-K. Jigs and Fixtures Increase Welding Output. Thomas J. Wood. *Iron Age,* v. 172, Dec. 10, 1953, p. 138-141.

Design and use for holding multi-component assemblies. Photographs. (K general)

51-K. Proper Technique Gives Stainless Good Weldability. Roy E. Solomon. *Iron Age,* v. 172, Dec. 10, 1953, p. 142-144.

Relatively low current, small diameter rod and stringer bead technique produce best welds. Short arc provides better weld zone protection and results in superior corrosion resistance and appearance. Preheating benefits crack-sensitive stainless steels and helps all types during cold weather. Diagram, photographs, table. (K9, SS)

52-K. Inert Gases Prevent Oxidation, Speed Welding of Magnesium. R. L. Nelson. *Iron Age,* v. 172, Dec. 10, 1953, p. 145-147.

Arc and spot welding of magnesium alloys. Includes effect of aluminum on weldability; tensile strength of welds; comparison of butt, fillet and lap joints; and comparison of ac vs. dc current. Photograph, diagram. (K1, K3, K9, Mg)

53-K. Force Fit Improves Brazed Aluminum Joints. Bruce E. Brennan. *Iron Age,* v. 172, Dec. 10, 1953, p. 148-149.

New technique of joining aluminum tubes which combines force fitting and brazing. Photograph. (K8, K13, Al)

54-K. Inconel: Which Welding Process Fits Your Job? K. M. Spicer. *Iron Age,* v. 172, Dec. 10, 1953, p. 150-152.

Factors involved in choosing a welding method for a given application. Tabulates minimum mechanical properties to be expected for various methods. Photographs, table. (K general, Q general, Ni)

55-K. The Iron Age Welding Rod and Electrode Charts. *Iron Age,* v. 172, Dec. 10, 1953, p. 153-158.

Tabulates suppliers and specifications of rods and electrodes for carbon and stainless steels, aluminum, copper, nickel and magnesium alloys. (K1, CN, SS, Al, Cu, Ni, Mg)

56-K. New Alloys Stop Corrosion in Silver-Brazed Type 430 Joints. J. J. Halbig, L. H. Grenell and G. H. Sistare. *Iron Age,* v. 172, Dec. 10, 1953, p. 159-163.

Most silver-brazed joints in Type 430 and other chromium-grade stainless steels are susceptible to separation under mildly corrosive conditions. Prevention depends on a nickel-rich layer over the area covered by the brazing alloy. Photographs, tables. (K8, SS)

57-K. Maintenance Welding Keeps Production Moving. W. G. Patton. *Iron Age,* v. 172, Dec. 10, 1953, p. 168-171.

Procedures at Ford Motor Co.'s River Rouge plant. Machine repair, rebuilding shafts and conveyor hooks. Photographs. (K general)

58-K. Precontrol Aids Resistance Weld Uniformity, Quality. Myron Zucker. *Iron Age,* v. 172, Dec. 10, 1953, p. 172-176.

Planning of setups and coordination of procedures for spot and projection welding. Table. (K3)

59-K. Welding Operations at Fruehauf Trailer. Fred W. Vogel. *Modern Machine Shop,* v. 26, Dec. 1953, p. 136-141.

Automatic spot and seam welding equipment, plant layout and operating procedures. Photographs. (K3)

60-K. Adhesives Advance. II. Metal-to-Metal Bonding. George Epstein. *Modern Plastics,* v. 31, Dec. 1953, p. 93-96, 202, 205, 206.

Advantages of adhesive joining, theory of adhesion, adhesives and design considerations. Photographs. (K12)

61-K. Arc Welding With Melting Electrodes in a Protective Gas Atmosphere. K. V. Lyubavskyi and N. M. Novozhilov. *South African Mining and Engineering Journal,* v. 64, pt. 2, Oct. 31, 1953, p. 317.

Translated from *Avtogennoe Delo,* January 1953, p. 4-8. Principle and advantages of process. (K1)

62-K. The Welding of Nickel Alloy Steels. I. *Steel Processing,* v. 39, Nov. 1953, p. 573-580, 611.

Arc welding of high-strength, low alloy steels, and low, medium, and high-carbon types of nickel steels. Tables, diagrams, photographs. 6 ref. (K1, AY)

63-K. Copper-Gold Brazing Done Under Glass. Fred M. Burt. *Welding Engineer,* v. 38, Dec. 1953, p. 60-61.

Induction brazing of small assemblies in a hydrogen atmosphere. Photographs. (K8, Cu, Au)

64-K. (French.) Weldability of Steel. *Fonderie,* 1953, Oct., no. 93, p. 3639-3652.

Studies of weldability of laminated elements, laminated elements with forged or punched pieces and molded steel. Diagrams, tables, graphs, photographs. (K9, AY)

65-K. (German.) Oxy-Acetylene Welding of Aluminum Materials. *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 109-113.

General procedure, fluxes, gas mixture, flame adjustment, types of joint and subsequent treatment of welded Al and Al alloys. Tables, diagrams. (K2, Al)

66-K. (German.) Brazing Cast Aluminum. *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 118-119.

General procedure and its application to the automobile industry. (K8, Al)

67-K. (Russian.) Contact Welding of Roofs of All-Metal Railroad Passenger Cars. V. V. Vershinskii, I. A. Morozov, A. V. Meier and P. B. Pankratov. *Vestnik Mashinostroenia,* v. 33, no. 8, Aug. 1953, p. 82-86.

Special equipment described. Photographs, diagrams. (K1)

68-K. Problems of Fabrication and Erection in All-Welded Multi-Storey Framed Buildings. D. C. C. Dixon. *Engineer,* v. 196, Dec. 4, 1953, p. 749-751.

Compares cost and weight of welded and riveted structures. Tables, diagrams. (K general)

69-K. Foundry Repair Welding. C. T. Williamsen. *Foundry,* v. 82, Jan. 1954, p. 204.

Reports salvaging of many defective castings through new welding methods and materials. Photographs. (K general, E general)

70-K. Copper and Silver Brazing Simplify Joining of Complicated Parts. L. F. Klein. *Materials & Methods,* v. 38, Dec. 1953, p. 108-109.

Combination of proper brazing techniques and simple shapes improves efficiency in production of small, complicated parts and permits use of dissimilar metals. Photographs. (K8)

71-K. Weldability of Steel as it Is Considered by Swiss Engineers. Charles G. Keel. *Metal Progress,* v. 65, Jan. 1954, p. 89-93.

Swiss specifications dealing with electrodes and weldable steels for penstocks, bridges, sluice gates and other massive objects working under high stresses. Photographs, tables. (K9, CN)

72-K. Welding and Efficient Maintenance. C. W. Brett. *Mine & Quarry Engineering,* v. 19, Dec. 1953, p. 461-465.

Modern applications of scientific welding discussed from standpoint of repair and strengthening of fractured plant. Photographs. (K general)

73-K. Observations on "Weak Laps" in Tinplate Can Bodies. W. E. Hoare and J. P. Gustin. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1042-1047, 1061.

Properties of tinplate which may be considered to affect seam performance. Observations on mechanical operations of body forming and on soldering operation proper also made. Photographs, tables. (K7, Q general, Sn)

74-K. The Gun That Shoots Handles. Eleanor Harvill. *Steelways,* v. 9, Dec. 1953, p. 18-19.

New applications and advantages of stud welding. Photographs. (K1)

75-K. A New Approach to Stitch Welding. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 448.

Machine which allows speeds as high as 300 welds per minute. Photograph. (K3)

76-K. Fabricating Switchgear by Welding. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 449-456.

Shop facilities and procedures. Photographs. (K general)

77-K. Welded Steel Fireboxes. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 457-460.

Fabrication of locomotive fireboxes. Photographs. (K general, CN)

78-K. Electronic Welding Controls. C. R. Bates. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 467-468, 474.

Advantages in use of controls. Various types, including program and slope controls. Diagram. (K1, K3)

79-K. Repair Welding of Ceramic-Coated Alloys. J. M. Riordan. *Welding Journal,* v. 32, Dec. 1953, p. 1160-1166.

Laboratory tests indicate procedures for field repairs of several alloys for high-temperature aircraft application. Table, photographs, micrographs, 5 ref. (K general, SG-h)

80-K. Inert-Tungsten Arc Welding of Stainless Steel Piping. F. J. Pilia. *Welding Journal,* v. 32, Dec. 1953, p. 1167-1174.

With suitable precautions and proper techniques it is possible to produce a surface on the inside of the pipe joint that is smooth and free from obstructions and notches. Photographs, diagrams. (K1, SS)

81-K. Spot Welding of Aluminum, Aluminum Alloys and Steel. W. J. Wilson. *Welding Journal,* v. 32, Dec. 1953, p. 1175-1180.

Results of tests of establish welding techniques and schedule which will produce satisfactory welds with special emphasis on the three variables: force, time and current. Graphs, photograph, diagram, micrographs. (K3, Al, ST)

82-K. Quality Control in Spot Welding Aluminum. Floyd H. Matthews. *Welding Journal,* v. 32, Dec. 1953, p. 1181-1194.

Equipment, processes and records. Photographs, charts, check sheets, graphs, tables. (K3, Al)

83-K. Welded Arch Bridge Over the Rio Blanco River in Mexico. Thomas C. Kavanagh and Camilo Piccone. *Welding Journal,* v. 32, Dec. 1953, p. 1195-1202.

Erection of a 250-ft., all-welded, splayed-arch bridge of unprecedented design. Photographs, diagram. (K general)

84-K. Stabilizing Austenitic Chrome-Nickel Weld Metal Against Intergranular Corrosion. Hallock C. Campbell. *Welding Journal,* v 32, Dec. 1953, p. 577s-584s.

22% Cr, 10% Ni electrode proposed as a substitute for usual columbium addition for protection against intergranular attack. Tables, diagram, micrographs, graphs. 4 ref. (K1, R2, SS)

85-K. Low-Temperature Bend Test Properties of Bead-on-Plate Welds. L. A. Harris, R. B. Matthiesen, and N. M. Newmark. *Welding Journal,* v. 32, Dec. 1953, p. 585s-599s.

Tests on welds of low-hydrogen and cellulosic-type electrodes with and without pre and post-heating. Photographs, diagrams, graphs, tables, micrographs. 6 ref. (K1, Q5)

86-K. (German and French.) Welding and Soldering in Metal Fabrication. F. Ulrich. *Zeitschrift für Schweisstechnik,* v. 43, no. 8, Aug. 1953, p. 147-152, 154-157.

Fabrication of useful and artistic metal articles. Photographs, diagram. (K general)

87-K. (German and French.) A New Oxy-Acetylene Welding Torch. New Possibilities for Electric Welding. Rudolf Weber and Max Maier. *Zeitschrift für Schweisstechnik,* v. 43, no. 11, Nov. 1953, p. 209-216.

Causes of flashback. Describes new torch which is insensitive to heat. Photographs, graphs. (K2)

88-K. (German and French.) Research on Operating Behavior of the Dry Generator ATE 50 N. C. Keel and P. Hartmann. *Zeitschrift für Schweisstechnik,* v. 43, no. 10, Oct. 1953, p. 195-200; no. 11, Nov. 1953, p. 216-218, 220-221.

Causes of disturbances and accidents with acetylene generators. Design and operating principles. Tables, diagrams. (To be continued.) (K2)

89-K. (German and French.) Weld Spattering in Oxy-Acetylene and Electric Welding. C. Keel and H. P. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 43, no. 11, Nov. 1953, p. 222-226.

Study on number, shape and size of spatter particles. Importance of precautions against fire. Diagrams, tables, photographs. (K2, K1)

90-K. (Russian.) New Electric Welding Methods. V. I. Popov. *Nauka i Zhizn,* v. 20, no. 7, July 1953, p. 5-7.

Automatic welding operations with rods up to 60 mm. in size. Special hydraulic drive secures hydraulic compression of 25 to 30 tons. Ap-

plication of method increased efficiency seven to eight times. Photographs, diagrams. (K6)

91-K. (Russian.) **Investigation of Welding Sheet Cast Iron.** A. Z. Blitshtein and S. M. Lashchiver. *Sel'khozmaschina,* 1953, no. 11, Nov., p. 19-23.
Production and use of cast iron-to-steel weldments in agricultural machinery. Tables, diagrams, micrographs. (K general, CI, ST)

92-K. (Spanish.) **Design for Welded Construction.** F. Koenigsberger. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 14 p.
Calculation of stresses and load capacity of weldments. Diagrams, tables, graphs. (K general, Q25)

93-K. (Spanish.) **The Problem of Rupture in Welded Ships.** E. Vollbrecht. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 8 p.
Special rules to be observed in construction of welded hulls. Diagrams. (K9)

94-K. (Spanish.) **Bronze Welding of Cast Iron.** *Fusion de Metales,* v. 16, no. 5, Nov.-Dec. 1953, p. 6-9.
Principles, advantages and limitations. Diagrams. (K8, CI)

95-K. Sheet-Metal Welding. III. Application of the Pantograph Principle to the Argon-Arc Welding of Gas-Turbine Assemblies. *Aircraft Production,* v. 15, Dec. 1953, p. 470-477.
Includes photographs, diagrams. (K1)

96-K. New Mill Induction Welds Aluminum Tubing. T. M. Rohan. *Iron Age,* v. 172, Dec. 17, 1953, p. 129-131.
Cost of induction welded tubing produced on the new mill is below that of extruded tubing of similar quality and is available in a wider range of alloys and in tempers from dead soft to full hard. Photographs, tables. (K6, Al)

97-K. Welding Aluminum Sheet. *Linde Tips,* v. 33, Jan. 1954, p. 5-9.
Preparations for welding, preheat temperatures and control of weld puddles. Photographs, diagrams. (K general, Al)

98-K. How to Handle a Heliarc Torch. *Linde Tips,* v. 33, Jan. 1954, p. 14-15.
Procedures for inert-gas shielded arc welding. Photographs. (K1)

99-K. Oxy-Acetylene Welding for Lengthening the Life of Wearing Parts With Bronze, Cast Iron and Steel Welding Rods. *Linde Tips,* v. 33, Jan. 1954, p. 16-17.
Tabulates procedures for resurfacing worn parts. (K2, L24, Cu, CI, CN, SS)

100-K. Correct Welding Procedure. V. Lester F. Spencer. *Sheet Metal Worker,* v. 45, Dec. 1953, p. 62-64.
Welding of aluminum-base alloys by carbon-arc, atomic hydrogen, and resistance methods. Tables. (To be continued.) (K1, K3, Al)

101-K. Weldability of Structural Steel. E. L. Erickson. *Welding Journal,* v. 32, Dec. 1953, p. 1155-1159.
Requirements and development of steels for ships, buildings and bridges from standpoint of government specifications and use. Tables. (K9, SS)

102-K. Tension, Shear and Impact Strengths of Spot-Welded Titanium Joints. M. L. Begeman, E. H. Block, Jr., and Frank W. McBee, Jr. *Welding Journal,* v. 32, Dec. 1953, p. 599S-604S.
Physical properties necessary for the design of spot welded joints in commercially pure titanium sheet. Tables, photograph, graphs. 13 ref. (K3, Ti)

103-K. Effect of Nitrogen and Carbon Dioxide Atmospheres on Arc Welding. F. W. Sowa, W. C. Truckenmiller and L. E. Wagner. *Welding Journal,* v. 32, Dec. 1953, p. 619S-624S.
Effect of surrounding atmosphere on formation, precipitation and distribution of oxide and nitride constituents. Tables, photographs, micrographs. (K1)

104-K. New High Speed Tube Mill at Kaiser Induction-Welds Aluminum Tubing. *Western Metals,* v. 11, Dec. 1953, p. 50-51.
Equipment, plant layout and operating procedures. Photographs. (K6, Al)

105-K. (Book.) **Quasi-Arc Welding Manual.** 2 Ed. Quasi-Arc Co., Bilston, Staffordshire, England. 7s. 6d.
Techniques of welding mild steel and other materials. Welding practices, plants, and equipment. Illustrations. (K1)

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Cleaning, Coating and Finishing

55-L. The Anodizing of Zirconium and Other Transition Metals in Nitric Acid. R. D. Misch and W. E. Ruther. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 531-537.
At 1 ma. per sq. cm. and concentrations of nitric acid exceeding 14% by weight, zirconium was found to develop a low-resistance oxide layer. Titanium, hafnium, columbium, tantalum and tungsten showed a high resistance at this current even in 70% acid. Graphs, tables, diagram. 20 ref. (L19, Zr, Ti, Hf, Cb, Ta, W)

56-L. The Interaction of Organic Compounds With the Surface During the Electrodeposition of Nickel. Clayton C. Roth and Henry Leidheiser, Jr. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 553-565.
Measurements of cathode potential were made during electrodeposition of nickel in presence of 76 organic compounds. Ability of the compound to make the cathode potential more negative at a fixed current density was dependent upon acidic or basic character of the compound, size of the molecule, and number of available pairs of electrons. Graphs, tables. 4 ref. (L17, Ni)

57-L. Electric Hot-Galvanizing Bath. *Engineering,* v. 176, Nov. 13, 1953, p. 638.
Equipment and its operation. (L16, Zn)

58-L. Studies in the Electrodeposition of Cobalt From Fluoborate Bath. D. M. Fegredo and J. Balachandra. *Indian Institute of Science, Journal,* v. 35, Sec. B, Oct. 1953, p. 191-201.
Optimum conditions for electrodeposition of cobalt determined from a study of the effect of different variables on plating characteristics of cobalt fluoborate solution. Tables, graphs. 8 ref. (L17, Co)

59-L. Electrodeposition of Copper From the Diethanolamine Bath. N. B. Shivaraman and T. L. Rama Char. *Indian Institute of Science, Journal,* v. 35, Sec. A, Oct. 1953, p. 293-297.
Bath composition and procedure for plating steel. Tables. 7 ref. (L17, Cu, ST)

60-L. Electrodeposition of Silver From the Iodide Bath. T. L. Rama Char and R. Sadagopachari. *Indian Institute of Science, Journal,* v. 35, Sec. A, Oct. 1953, p. 298-306.
Silver was electrodeposited on copper from a complex iodide solution. Tables. 11 ref. (L17, Ag, Cu)

61-L. Abrasion Resistant Coatings Sprayed on Metal Surfaces. W. G. Patton. *Iron Age,* v. 172, Dec. 3, 1953, p. 172-173.
Surface preparation and spraying operations in application of nickel-base alloy to pump plungers. Photographs. (L23, Ni, CN)

62-L. Intricate Procedures Solve Tough Hard-Facing Problems. J. Wischhusen. *Iron Age,* v. 172, Dec. 10, 1953, p. 164-167.
Rebuilding worn areas along flight edge of an extrusion screw and hard facing a cage wall in a steam valve. Photographs. (L24)

63-L. Vitreous-Enamelled Aluminium Stock. C. R. Sigler. *Light Metals,* v. 16, Nov. 1953, p. 358-360.
Pickling, spraying, firing and inspection. Photographs. (To be concluded.) (L27, Al)

64-L. Chemical and Anodic Treatments. *Light Metals,* v. 16, Nov. 1953, p. 377.
Analysis of German patents on anodizing. Photograph. (L14, L19)

65-L. The Diffubrite Chromium Diffusion Process. *Machinery,* v. 83, Nov. 6, 1953, p. 891-897.
Method of treatment and applications of the process. Photographs, tables, micrographs. (L15, Cr, ST)

66-L. Ultrasonic Cleaning. *Machinery,* v. 83, Nov. 20, 1953, p. 1000.
Cleaning apparatus. Photographs. (L10)

67-L. A Statistical Quality Control Approach to the Control of Plating Solutions. Allan D. Woodell. *Metal Finishing,* v. 51, Dec. 1953, p. 54-58.
Technique as a system of inspection, analysis and action. Photograph, charts. (L17, S12)

68-L. Vacuum Metallizing and Plating—A Comparison. Isidore Cross. *Metal Finishing,* v. 51, Dec. 1953, p. 59-63, 78.
Compares vacuum evaporation with electroplating. Limitations, advantages and applications of each. Photographs. (L25, L17)

69-L. Metal Cleaning of Fine Instrument Components. Edward A. Hedman and Arnold Miller. *Metal Finishing,* v. 51, Dec. 1953, p. 66-68.
Role of contaminants in deterioration of fine instruments. Experimental studies leading to development of suitable cleaner. 4 ref. (L12)

70-L. Electroplating in Israel. Marvin Rubinstein. *Metal Finishing,* v. 51, Dec. 1953, p. 69-73, 78.
Characteristics of finishing, cleaning procedures, plating solutions, quality control, polishing materials and equipment utilized. Photographs. (L17)

71-L. Inhibitors for Metal Finishing. R. O. Bailey. *Metal Industry,* v. 83, Nov. 20, 1953, p. 421-422.
Properties and effects of inhibitors used in acid solutions for pickling steel and ferrous alloys. (L12, ST)

72-L. Running a Production Test of Metal Cleaning Abrasives. *Metal-Working,* v. 9, Dec. 1953, p. 18-19.
Steps in determining over-all efficiency of abrasives. Graphs, tables. (L10)

73-L. Vacuum Metallizing of Plastic Sheet. G. H. Bancroft. *Modern Plastics,* v. 31, Dec. 1953, p. 122-123, 210.
Equipment and operating procedures for coating acetate and styrene sheet with aluminum. Photograph. (L25, Al)

74-L. Adapting Spraying Methods to Various Finishes and Operations. H. Preuss. *Organic Finishing,* v. 14, Nov. 1953, p. 20-25, 29.
Standard spray gun parts can be varied to accomplish specific purposes. Special types of guns developed for unusual applications. Photographs. (L23)

75-L. Phosphatizing Steel Surfaces. John E. Trumbour. *Organic Finishing,* v. 14, Nov. 1953, p. 26-29.
Uses of phosphate coatings to im-

prove paint bonding and prevent corrosion and methods of applying and evaluating coatings. Photographs. (L14)

76-L. Automotive Production Finishing. VII. The Changing Aspects of Automotive Finishes and Their Testing. Rick Mansell. *Organic Finishing*, v. 14, Nov. 1953, p. 30-33.

Recent changes in composition, application techniques and testing. Photographs. (L general)

77-L. The Origin of Stress in Metal Layers Condensed From the Vapour in High Vacuum. H. P. Murbach and H. Wilman. *Physical Society, Proceedings*, v. 66, no. 407 B, Nov. 1953, p. 905-910.

Measurements of stress in deposits of Ni, Fe, Pb, Au, Cu, Ag, Sb, Al, Bi, Mg and Zn on copper strips. Stress found to be characteristically of a tensile nature and amount of stress is different for different metals. Diagram, tables. (L25, Q25, Ni, Fe, Ph, Au, Cu, Ag, Sb, Al, Bi, Mg, Zn)

78-L. Reflectivity of Thin Aluminium Films and Their Use in Interferometry. J. C. Burridge, H. Kuhn and Anne Pery. *Physical Society, Proceedings*, v. 66, no. 407 B, Nov. 1953, p. 963-968.

Coefficients of transmission and reflection of thin aluminum films deposited on silica by vacuum evaporation were measured for wavelengths between 4200 and 2600 Å. Graphs. 4 ref. (L25, T8, P17, Al)

79-L. Plan Protective Painting to Reduce Electrolytic Corrosion. L. G. Jones. *Power Engineering*, v. 57, Dec. 1953, p. 82-83.

Electrolytic corrosion of metals and protection by anodic coatings on paints. Photograph, table. 5 ref. (L19, R1)

80-L. Barrel Finishing. J. G. Reed. *Screw Machine Engineering*, v. 15, Dec. 1953, p. 53-56.

Advantages and operating procedures. Photographs, table. (L10)

81-L. Plated Coatings. Designers Weigh Tin Alloys. Frederick A. Lowenheim. *Steel*, v. 133, Nov. 30, 1953, p. 110-112.

Present ample tin supply leads to closer examination of its potential as an alloying constituent. Success is seen with lead, zinc, nickel, copper and cadmium. Photographs, tables. 8 ref. (L17, Cd, Cu, Ni, Pb, Sn, Zn)

82-L. Instrumentation for Surface Finishing of Jet Engine Parts. R. J. Thomas. *Steel Processing*, v. 39, Nov. 1953, p. 591-593.

Automatic control equipment in finishing operations. Photographs. (L24, S18)

83-L. (French.) Electrolytic Polishing of Germanium and Platinum in the Presence of F- or Cl-Ions. Philippe Brouillet and Israel Epelboin. *Comptes rendus*, v. 237, no. 16, Oct. 19, 1953, p. 895-897.

Reports on experiments using a mixture of NaCl-KCl, melting at 661° C. and the eutectic FNa-FK (699° C.), and a platinum electrode. Results are discussed. 5 ref. (L13, Ge, Pt)

84-L. (French.) Diffusion of Metallic Ions Through Electrodeposited Metals. Helmi Makram. *Comptes rendus*. v. 237, no. 18, Nov. 12, 1953, p. 1086-1088.

Variation of passage of copper ions through chromium plating as a function of chromium bath composition. Graphs. (L17, N1, Cu, Cr)

85-L. (French.) Determination of the Reflection, Transmission, and Adsorption Factors of Thin Vapor-Deposited Gold Layers. P. Rouard, D. Malé and J. Trompette. *Journal de physique et le radium*, v. 14, no. 11, Nov. 1953, p. 587-590.

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: INDEX OF ACP CHEMICALS FOR METAL PRESERVATION AND PAINT PROTECTION

METAL	OPERATION	ACP CHEMICAL
ALUMINUM	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Preparation for Painting	"ALODINE" "DURIDINE" "DEOXIDINE"
	Protection from Corrosion	"ALODINE"
BRASS	Brightening	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK
	Corrosion Prevention	"CUPROTEK"
	Soldering Flux	"FLOSOL"
COPPER, BERYLLIUM, AND COPPER ALLOYS	Brightening	"ACP BRIGHT DIP"
	Cleaning	"DEOXIDINE" "DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "CUPROTEK"
	Coating Steel with Copper	"CUPRODINE"
	Corrosion Prevention	"CUPROTEK"
	Scale Modification	"RIDOXINE"
	Soldering Flux	"FLOSOL"
	Stripping Copper Coatings	"ACP COPPER STRIPPING SOLUTION"
GALVANIZED IRON, ZINC, AND CADMIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Corrosion Proofing	"ZINODINE"
	Paint Bonding	"ZINODINE"
	Phosphate Coating, in Preparation for Painting	"LITHOFORM"
	Soldering Flux	"FLOSOL"
IRON AND STEEL	Chromate Coating, in Preparation for Painting	"CROMODINE"
	Cleaning	"ACP RIDOLINES AND RIDOSOLS"
	Cleaning for Painting	"DEOXIDINE" "DURIDINE"
	Coating with Copper	"CUPRODINE"
	Drawing and Extrusion	"GRANODRAW"
	Paint Bonding	"CROMODINE" "DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Paint Stripping	"CAUSTIC SODA AND SOLVENT NO. 3"
	Phosphate Coating, in Preparation for Painting	"DURIDINE" "GRANODINE" "PERMADINE" "THERMOIL-GRANODINE"
	Phosphate Coating, to Protect Friction Surfaces	"THERMOIL-GRANODINE"
	Pickling with Inhibited Acids	"RODINE"
	Rust Prevention for Unpainted Iron	"PEROLINE"
	Rust Proofing	"PERMADINE" "THERMOIL-GRANODINE"
	Rust Removal—Brush, Dip, or Spray	"DEOXIDINE"
	Soldering Flux	"FLOSOL"
MAGNESIUM	Cleaning	"DURIDINE" "ACP RIDOLINES AND RIDOSOLS"
	Pickling	"RODINE (M-200)"
STAINLESS STEEL	Cleaning	"DEOXIDINE"
	Coating with Copper	"CUPRODINE"
	Pickle Polishing	"RODINE"
	Soldering Flux	"FLOSOL"

CHEMICALS ACP PROCESSES

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CHEMICALS ACP PROCESSES

Investigations on layers deposited on glass. Experimental details. Tables. 6 ref. (L25, P17, Au)

86-L. (French.) **Hot Tinning.** G. Haas. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 895.

Finishing operations and drying equipment. (L16)

87-L. (German.) **Aluminum for Decorative Uses.** D. Lenz. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 451-461.

Mechanical rough polishing and degreasing; electrolytical glazing; and chemical polishing. Graphs, tables, photographs, micrographs. 21 ref. (L10, L12, L13, Al)

88-L. (German.) **The Anodic Treatment of Strips and Wires.** E. Herrmann. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 465-472.

Stagnant anodic treatment, induction of electric power, prevention of overheating and cooling. Diagrams. 34 ref. (L19, Al)

89-L. (German.) **Electric Deposition Welding of Rails. II.** Franz Novotny. *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 113-117.

Repair of worn parts of streetcar rails by electric deposition welding with different types of electrodes. Photographs. (L24)

90-L. (Russian.) **Certain Peculiarities of Polishing of Chromium-Plated Parts.** N. A. Kamenev and A. A. Mikhailov. *Stanki i Instrument,* v. 14, no. 7, July 1953, p. 20-23.

Wear resistance depends on nature of mechanical processing. Tables, graphs. (L10, Cr)

91-L. (Russian.) **Heat Resistance During Surface Alloying of Steel With Other Metals.** G. N. Dubinin. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 74-79.

Results show that chromized iron and steel displayed the best heat resistance. Tables, graphs. 23 ref. (L14, R2, Cr, Fe, ST)

92-L. The Anodic Oxidation of Metals at Very Low Current Density. II. Nickel. III. Copper. S. E. S. El Wakkad and Sayeda H. Emara. *Chemical Society, Journal,* 1953, Nov., p. 3504-3512.

Studies in solutions of different pH values. Potential measurements made. Graphs, tables. (L19, Ni, Cu)

93-L. Vitreous Enamelling in Sweden, Denmark and Finland. J. H. Gray. *Foundry Trade Journal,* v. 95, Dec. 3, 1953, p. 679-686.

Enameling industry as it exists today. Photographs, tables. (To be concluded.) (L27, CN, CI)

94-L. Factors Affecting the Selection of a Finish for Gas-Fired Space Heating Equipment. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 248-253.

Compares vitreous enamels with other types of finishes for radiant heaters. Photographs. (L27)

95-L. Tin Printing on the Grand Scale. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 254-258.

Facilities of tin-printing plant. Photographs. (L26, Sn)

96-L. Chemical Treatment of Ships' Hulls. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 260-262.

Tests of "Foscote R. S." coating designed for use on rusted steel. Photographs, table. (L12)

97-L. Filling Leads to Fine Finishes. J. H. Ousbey. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 266, 268-280.

Fillers and their application to cast iron. Diagram. (L general, CI)

98-L. Electrolytic-Tinplate Instrumentation. William P. Smith. *Instruments,* v. 26, Dec. 1953, p. 1875, 1905-1906.

Each step on the electrolytic-tinplate production process uses instrumentation. Work remains to be done at several key points in the process. (L17, S18, Sn)

99-L. Selecting Ceramic Coatings for Jet Engine Parts. W. C. Rous, Jr. *Materials & Methods,* v. 38, Dec. 1953, p. 116-119.

Purposes and characteristics of ceramic coatings. Types, tests and processes. Tables, photographs. (L27)

100-L. Hard Chrome Plating Made Easy. Ezra A. Blount. *Product Finishing,* v. 18, Dec. 1953, p. 24-34, 36.

Chromium plating of dies for the plastic molding industry, gages, tools and parts for special applications. Photographs, table. 4 ref. (L17, Cr)

101-L. Stretcher-Strain Markings in Aluminium Alloys and Methods for Their Elimination. V. A. Phillips. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1048-1054.

Includes tables, photographs. 9 ref. (L10, L12, Mg, Al)

102-L. Surface Treatment and Finishing of Light Metals. VIII. S. Wernick and R. Pinner. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1055-1061.

Includes photographs, table. 31 ref. (To be continued.) (L general, Al)

103-L. Design for Longer Pickling Equipment Life. J. F. Revilock. *Steel,* v. 133, Dec. 21, 1953, p. 84, 86, 88.

Applications of carbon and graphite in wet and dry pickling equipment. Design tips and performance data. Diagrams. (L12)

104-L. Bronze Plating Solves Design and Corrosion Problems. W. H. Safranek, W. J. Neill and D. E. Seelbach. *Steel,* v. 133, Dec. 21, 1953, p. 102-104, 106, 109.

Bronze plating process, its advantages and applications. Photographs, micrographs. 6 ref. (L17, Cu)

105-L. Mechanical Descaling of Wire Rods Improves Coating. *Steel,* v. 133, Dec. 21, 1953, p. 114, 116-117.

Descaling, drawing compounds and diamonds used in drawing dies. Photograph. (L10, F28, CN)

106-L. (French.) **Action of Ultrasounds During Anodic Oxidation.** Jean-Jacques Trillat. *Comptes rendus,* v. 237, no. 19, Nov. 9, 1953, p. 1147-1148.

By causing an aluminum leaf to vibrate at ultrasonic frequencies and at the same time subjecting it to anodic oxidation, it was noted that structure and properties of the layer of alumina formed are very different from those obtained in absence of ultrasounds. Diagram. (L19, Al)

107-L. (French.) **Experimental Study of the Poisoning of a Platinum-Platinum Electrode.** Maurice Bonnemay. *Comptes rendus,* v. 237, no. 20, Nov. 16, 1953, p. 1235-1237.

Study of hydrogen overvoltage curve relative to platinum-platinum electrodes poisoned by micro deposits of lead or zinc. Graphs. (L17, Pb, Zn)

108-L. (Polish.) **Anticorrosive Hard Rubber Coatings.** Z. Macek. *Przemysl Chemiczny,* v. 9, no. 8, Aug. 1953, p. 426-428.

Coating of chemical equipment. Compares behavior of various compounds. Tables, photographs. (L26)

109-L. (Russian.) **Mechanism of the Process of Electropolishing Copper in Phosphoric Acid.** A. V. Fortunatov and A. V. Finkel'shtein. *Doklady Akademii Nauk SSSR,* v. 90, no. 5, June 11, 1953, p. 823-826.

Representation of mechanism and kinetic equations developed which conform well with experimentation. Graphs, tables. 5 ref. (L13, Cu)

110-L. (Russian.) **Influence of Oxide Coatings on Deformation of Aluminum in Inactive and Active Mediums.** L. A. Kochanova and B. Ia. Iampol'skii. *Doklady Akademii Nauk SSSR,* v. 92, no. 1, Sept. 1, 1953, p. 119-122.

Tests on polycrystalline pure aluminum wire. Table, graphs. 10 ref. (L14, Al)

111-L. How to Make Steel Last Three Times as Long. Fred B. Shaw. *American Machinist,* v. 97, Dec. 21, 1953, p. 97-99.

Ceramic coatings help protect against "hot spots" when metals are exposed to high temperatures and produce a surface smoothness that has minimum resistance to flow of hot gases. Photographs. (L27)

112-L. Flame Spraying Ceramics. Thomas A. Dickinson. *Ceramic Age,* v. 62, sec. 1, Dec. 1953, p. 15-16.

Process for coating metals with refractory materials. Photographs, diagram. (L27)

113-L. Theory of Adherence of Enamel on Iron. A. Dietzel. *Ceramic Age,* v. 62, sec. 1, Dec. 1953, p. 17, 20, 21, 24, 38, 39. (Translated from *Sprechsaal* v. 78, no. 5, 1945, p. 12.)

Formation of iron oxide interface, formation of dendrites, theory of gripping and electrochemical theory. Tables. 22 ref. (L27, Fe)

114-L. Finishing With Polyesters. Frank Charity. *Consulting Engineer,* v. 2, Dec. 1953, p. 26-29.

Resin classifications, forms available, outstanding properties, application methods and typical uses. Photographs, table. (L26)

115-L. Theory of Electrolytic Polishing. A Review. R. Pinner. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 444-450.

Graphs, diagram. 29 ref. (L13)

116-L. Finishes Alternative to Conventional Nickel-Chromium. J. Chadwick. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 451-455.

Corrosion resistance of various substitutes for normal nickel-chromium plating were investigated in marine, industrial and indoor exposures over 2½ years. A high-temperature chromium plating technique is described which gives corrosion resistance almost three times that of normal deposits. Graph, tables. 4 ref. (L17, R3, Ni, Cr)

117-L. A Simple Costing System for General Plating Shops. Fredk. C. Pond. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 457-458.

Records and procedures. (L general, A6)

118-L. Preparation of Copper and Copper-Base Alloys for Electroplating. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 459-460.

Summarizes ASTM tentative recommended practice B281-53T. (L17)

119-L. Production of Radio Circuits by Metal Spraying. *Electroplating and Metal Finishing,* v. 6; *Metal Spraying,* v. 3, Dec. 1953, p. 472-473.

Procedures and equipment. Diagrams. 4 ref. (L23)

120-L. Porosity of Sprayed Coatings. II. Mechanical Treatments and Lubrication. D. de Paauw. *Electroplating and Metal Finishing,* v. 6; *Metal Spraying,* v. 3, Dec. 1953, p. 475-476.

Effect of mechanical treatments such as grinding and polishing and function of porosity in use of metal-sprayed bearing parts. Graph, tables. (To be concluded.) (L23, G18, L10)

121-L. Spray Equipment. William Beacham. *Industrial Finishing,* v. 30, Dec. 1953, p. 26-28, 30, 32.

Spray guns, circulating paint systems, hose, hose connections and spray booths. Photographs. (L26)

122-L. From Hot Spray to Airless Spray. James A. Bede. *Industrial Finishing,* v. 30, Dec. 1953, p. 40, 42, 44, 46.

Role of paint heaters in hot-spray painting. Development and advantages of airless spray process. Photographs. (L26)

123-L. Titanium Descaled Successfully With Sodium Hydride. Marshall Sittig. *Iron Age,* v. 172, Dec. 17, 1953, p. 137-139.

Even in sheets as thin as 0.015 in., bath works successfully without burn-through if temperatures are carefully controlled. Photographs, diagrams. (L12, Ti)

124-L. Plating Tin on Aluminium. J. M. Bryan. *Metal Industry,* v. 83, Dec. 4, 1953, p. 461-463.

Results of studies undertaken to ascertain whether a satisfactory deposit of tin could be formed by simple chemical displacement which would serve either by itself as a surface finish for aluminum or as a base for soldering and electroplating. Table. 14 ref. (To be concluded.) (L15, Sn, Al)

125-L. How to Finish Magnesium. Hugo A. Barbian. *Modern Metals,* v. 9, Dec. 1953, p. 66-68, 70-71.

Finishing requirements, experience with presently available finishes and prospects for development of improved finishes in the future. Diagrams, tables. (L general, Mg)

126-L. Solubility Factor in Metal Phosphate Pre-Treatments. Max Kronstein, Philip Hixon and Jack Granowitz. *Paint and Varnish Production,* v. 43, Dec. 1953, p. 19-30.

Study of metal-phosphate coatings on steel as a base for paint application. Graphs, tables, photographs, diagram. 4 ref. (L14)

127-L. Paint Technology and the Law. I. M. H. M. Arnold. *Paint Manufacture,* v. 23, Dec. 1953, p. 400-401.

Broad aspects of English laws regulating use of lead paints, cellulose solutions and inflammable liquids. (L26)

128-L. Clad Metals and Clad Metal Processing. Walter L. Keene. *Steel Processing,* v. 39, Dec. 1953, p. 647-653.

Methods of cladding, including pressing, casting, direct rolling, sintering and deposition. Diagrams, photographs, micrographs. (L22)

129-L. Phosphate Coating as a Pre-Paint. Carl S. Rankin. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 98-100.

Treating metal surfaces with a phosphate coating, prior to painting, assures a good clean bond between the surface and paint. Phosphating also reduces chemical reaction when protectiveness of paint is removed. Micrographs, photograph. (L14, L26)

130-L. A New Style De-Scaling Machine. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1315-1316.

(Translated and abridged from *Draht,* March 1953.) Description of equipment and operating characteristics. Photographs. (L10)

131-L. (Hungarian.) **Modern Cleaning of Castings.** György Szvath. *Ontöde,* v. 4, no. 9, Sept., p. 202-204.

Modern processes and machinery with special emphasis on elimination of dust and proper airing of the shop. (To be continued.) (L10, A5, E general)

A.S.M. MIDWINTER MEETING

Hotel Statler

Boston, Mass.

March 4-5, 1954

M

Metallography, Constitution and Primary Structures

29-M. The Preparation and Properties of Molybdenum-Germanium Compounds. Alan W. Searcy and Robert J. Peavler. *American Chemical Society, Journal,* v. 75, Nov. 20, 1953, p. 5657-5659.

X-ray diffraction investigation established existence of Mo_3Ge_2, Mo_5Ge_3, alpha-$MoGe_2$ and beta-$MoGe_2$ in addition to Mo_3Ge which has already been reported. Tables. 8 ref. (M22, P general, Ge, Mo)

30-M. A Survey of the Uranium-Nickel System. J. D. Grogan and R. J. Pleasance. **Appendix on an X-Ray Examination of Some Uranium-Nickel Alloys.** Betty E. Williams. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 141-147.

Liquidus curve plotted and phase compositions determined. Phase diagram, tables, micrographs. (M24, Ni, U)

31-M. McQuaid-Ehn Grain Size Determined by Spectrochemical Analysis. G. E. Ressler. *Journal of Metals,* v. 5, Dec. 1953, p. 1622.

Correlates aluminum determinations with grain size in carburizing and medium carbon grades of killed steel. Table. (M27, S11, CN)

32-M. Surface Structures on Single Crystals Produced From Melt. F. D. Rosi. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1661-1662.

Transverse cellular structure and longitudinal striae on crystals produced by the Bridgeman method. Micrographs. 8 ref. (M26, M28, Cu)

33-M. Hyperfine Structure of Silver and Gold by the Atomic Beam Magnetic Resonance Method. Günter Wessel and Hin Lew. *Physical Review,* v. 92, ser. 2, Nov. 1, 1953, p. 641-646.

Hyperfine structures of ground states studied by means of an ionizer of electron bombardment-type applied to a beam of atoms in a magnetic resonance apparatus. Diagrams, graphs, tables. 17 ref. (M23, M25, Ag, Au)

34-M. The Zeeman Effect of the Cr Ground State. P. Brix, J. T. Eisinger, H. Lew and G. Wessel. *Physical Review,* v. 92, ser. 2, Nov. 1, 1953, p. 647-650.

Studies using the atomic beam magnetic resonance method at magnetic fields up to 850 gauss. Chromium atoms detected by means of an electron-bombardment type ionizer. Tables, graphs. 14 ref. (M23, M25, Cr)

35-M. (French.) **Observation of Polygonization in Uranium by X-Ray Diffraction.** Adrienne R. Weill and Pierre A. Jacquet. *Comptes rendus,* v. 237, no. 17, Oct. 28, 1953, p. 1002-1003.

Method permits study of grain substructure and simultaneous comparison of microscopic and radiocrystallographic examinations. Micrographs. 5 ref. (M22, M21, M23, U)

36-M. (German.) **The Iron-Iron Silicide-Copper Silicide-Copper Constitution Diagram.** Rudolf Vogel and Dietrich Horstmann. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 435-440.

Thermal and metallographic study of iron-silicon-copper system and determination of lower and upper critical temperature of ternary miscibility gap. Tables, graphs, micrographs. (M24, Cu, Si, Fe)

37-M. (German.) **The Chromium-Silicon System, and Some Silicide Solid Solutions.** Richard Kieffer, Friedrich Benesovsky and Hermann Schroth. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 437-442.

Production of specimens by hot pressing and melting. Scaling behavior and physical properties. Preliminary phase diagram plotted on basis of melting point and structural and radiographic investigations. Investigations are reported on $CrSi_2$-$TiSi_2$, $CrSi_2$-$TaSi_2$, and Cr_3Si-Mo_3Si. Tables, micrographs. 31 ref. (M24, Cr, Si, Mo)

38-M. (German.) **Crystal Chemistry of B-Metals. II. Discussion and Investigation of Trigonally Distorted NaCl Structures.** Konrad Schubert and Horst Fricke. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 457-461.

Occurrence of trigonally distorted NaCl (B1) systems. Effect of third components upon axial relations of SnSb. Crystal structure of GeTe and Bi_2Se_3. Graphs, micrographs, table. 12 ref. (M26, Nb, Sb, Ge, Te, Bi, Se)

39-M. (German.) **The Dependence of the Solidification Curve Upon Orientation in Cubic, Face-Centered Metal Crystals.** P. Haasen. *Zeitschrift für Physik,* v. 136, no. 1, 1953, p. 26-39.

Theoretical interpretation of previous experimental findings on basis of a specific mutual effect of a displacement in main glide system and displacement in the various disturbance systems. Tables, graphs. 33 ref. (M26, N12)

40-M. (Russian.) **Problem of the Structure of Oxide Forming on Aluminum Surface.** M. S. Beletskii. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 89-91.

Interatomic distances of gamma oxide crystals determined by X-ray structural analysis. Graph. 4 ref. (M26, R2, Al)

41-M. (Russian.) **Changes on Metal Surfaces Caused by Chemical Processes and Heating.** S. Z. Roginskii, I. I. Tretiakov and A. B. Shekhter. *Doklady Akademii Nauk SSSR,* v. 91, no. 5, Aug. 11, 1953, p. 1167-1169 + 1 plate.

Electron microscopic investigations of surface changes under various conditions detected new characteristics. Micrographs. 7 ref. (M21)

42-M. The Electron Microscope and Its Application to Metallurgy. V. A. Pickles. *Australasian Engineer,* 1953, Oct., p. 61-69.

Includes photographs, diagrams, tables. 45 ref. (M21)

43-M. Heat Treating Temperatures in Relation to the Iron-Carbon Diagram. *Materials & Methods,* v. 38, Dec. 1953, p. 147.

Phase diagram from paper by Edward J. Ocean at the A.G.A. Industrial Gas School, May 1953. (M24)

44-M. Automatic Grain Counter for Assessing Quantitatively High-Resolution Autoradiographs. R. A. Dudley and S. R. Pelc. *Nature,* v. 172, Nov. 28, 1953, p. 992-993.

Construction and operation. Graph. 2 ref. (M23)

45-M. (French.) **The Use of Radio-Elements to Study Segregation of Impurities in High-Purity Aluminum Grain Boundaries.** F. Montariol, Ph. Albert and G. Chaudron. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 768-774.

Results show that method is valu-

able when impurities consist of zinc or ruthenium. Micrographs, table. 4 ref. (M23, Al, Zn, Ru)

46-M. (Russian.) **Structure and Properties of Chromium Nitride and Ferrochromium.** M. L. Korolev. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1465-1470.

Chromium-nitrogen alloys were prepared and tested. Hardness of structural components was measured at temperatures up to 1000° C. Tables, graphs, diagram. 8 ref. (M27, Q general)

47-M. (French.) **Electron Diffraction Studies of the Formation of Single Crystals of Aluminum-Copper Alloys by Heating in Vacuum.** Noboru Takahashi and Jean-Jacques Trillat. *Comptes rendus,* v. 237, no. 19, Nov. 16, 1953, p. 1246-1248.

Appearance and transformation of certain phases of aluminum-copper alloys to the monocrystalline state. Includes Debye-Scherrer diagrams. (M22, Al, Cu)

48-M. Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements. Jules de Launay. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 1975-1986.

Includes diagrams. 16 ref. (M26)

49-M. Some Alloy Systems of Titanium. Maurice Cook. *Light Metals,* v. 16, Dec. 1953, p. 400-401.

Properties, phase transformations and microstructure of various alloys. Micrographs, graphs. (M24, M27, N6, Q general, Ti)

50-M. Typical Microstructures of Commercial Titanium Alloys. Roman Osadchuk, William P. Koster, and John F. Kahles. *Metal Progress,* v. 64, Nov. 1953, p. 96B.

Data sheet. (M27, Ti)

51-M. The Nonhomogeneity of Austenite. I. A. Oding and M. G. Lozinsky. *National Science Foundation Translation,* no. 52, Aug. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 275-278.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Studies of factors that apparently affect formation of nonhomogeneous structure of austenite grains in steel. Diagram, graph, micrographs. 8 ref. (M27, N8, AY)

52-M. Scattering of X-Rays by Metals at Very Small Angles. B. M. Rovinsky and V. M. Genkin. *National Science Founation Translation,* no. 84, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89. no. 4, Apr. 1953, p. 673-675.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 434-M, 1953. (M22)

53-M. An X-Ray Examination of an Alpha (Al-Fe-Si) Ternary Compound. Keith Robinson and P. J. Black. *Philosophical Magazine,* v. 44, 7th ser., no. 359, Dec. 1953, p. 1392-1397.

Results of experimental studies. Diagrams. 10 ref. (M26, M22)

54-M. (Book.) **Data for X-Ray Analysis. v. I. Charts for Solution of Bragg's Equation (*d* Versus *Theta* and Two *Theta*). W. Parrish, M. G. Ekstein and B. W. Irwin, 81 p. v. II. Tables for Computing the Lattice Constant for Cubic Crystals.** W. Parrish, M. G. Ekstein and B. W. Irwin. 99 p. 1953. N. V. Phillips' Gloeilampenfabrieken, Eindhoven, Netherlands; Cleaver-Hume Press, Ltd., 42a South Audley Street, W.1, London. 15s. each.

The first volume contains 85 charts of interplanar spacing *d* versus Bragg angle *theta* for the *Ka* radiations of five target materials, namely molybdenum, copper, cobalt, iron and chromium. Valuable for users of X-ray spectrometers. In the second volume, data necessary for the accurate determination of lattice parameters of cubic crystals are presented as a series of tables. (M26, S11)

N

Transformations and Resulting Structures

17-N. Production of Single Crystals of Nickel. R. F. Pearson. *British Journal of Applied Physics,* v. 4, Nov. 1953, p. 342-344.

Detailed account. Preparation of faces parallel to desired crystal planes. Diagrams, photograph. 3 ref. (N12, M26, Ni)

18-N. The Distribution of Solute in Crystals Grown From the Melt. I. Theoretical. J. A. Burton, R. C. Prim and W. P. Slichter. **II. Experimental.** J. A. Burton, E. D. Kolb, W. P. Slichter and J. D. Struthers. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 1987-1996.

Incorporation of solute elements into single crystals of germanium grown from the melt. Variation of distribution coefficient with conditions of crystallization. Graphs, diagrams, tables. 24 ref. (N12, Ge)

19-N. Segregation of Impurities During the Growth of Germanium and Silicon Crystals. R. N. Hall. *Journal of Physical Chemistry,* v. 57, Nov. 1953, p. 836-839; disc., p. 839.

Segregation of impurities found to depend upon growth rate and crystal orientation as well as upon degree of stirring in the melt. Graphs. 8 ref. (N12, Ge, Si)

20-N. (French.) **Textures of Secondary Recrystallization in Mild Iron.** Roger Guihaumé, Micheline Sternberg and Paul Lacombe. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 904-906.

Details of investigations, crystal orientation, and differences in a large number of specimens. 4 ref. (N5, Fe)

21-N. (French.) **Orientation of Gamma-Alumina on the Surface of Melted Aluminum.** Shigueo Oketani and Sigemaro Nagakura. *Métaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 435-436.

Includes tables and graphs. 3 ref. (N12, M26, Al)

22-N. (French.) **Production of Recrystallization Textures.** P. Coheur. *Métaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 423-434.

Properties of the metals, factors depending on the laminating and factors characterizing the annealing. Diagrams, radiograms, tables. 19 ref. (N5, J23)

23-N. (German.) **The Cooling Curve of Cast Iron With Spherical Graphite.** Adalbert Wittmoser. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct. 1953, p. 431-434.

Investigates discrepancies in cooling curves by different authors. Experiments reveal that disagreement was due to differences in graphite composition. Tables, graphs, photographs, diagrams. 15 ref. (N8, J general, CI)

24-N. (German.) **Transposition Reactions in the Iron-Silicon System.** Erich Fitzer. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 462-472.

Solid reactions occurring when phases are in contact which do not correspond to thermal equilibrium state. Diffusion of silicon in the alpha solid solution. Concentration dependence of diffusion coefficient and stratification in Fe-FeSi and Fe-Si arrangements. Theoretical findings applied to practical cases. Diagrams, micrographs, graphs, table, photographs. 26 ref. (N1, Fe, Si)

25-N. (Russian.) **Displacement of Grain Boundaries of Heated Metal.** I. A. Oding, M. G. Lozinskii and S. G. Fedotov. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 75-77 + 1 plate.

Grain boundary of N-12 steel was displaced with an average linear velocity of 0.10 to 0.16 mm. per hr. Tin-bronze velocity was 0.30 to 0.40 mm. per hr. Micrographs. 12 ref. (N3, AY, Sn, Cu)

26-N. (Russian.) **Diffusion of Iron Into Nickel.** M. B. Neiman, A. Ia. Shiniaev, and B. G. Dzantiev. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 265-267.

Studies made by following a new variant of tracer technique for determining diffusion in solid bodies. Graphs, table. 7 ref. (N1, Fe, Ni)

27-N. (Russian.) **Precipitation of Nickel Tantalide Ni_3Ta From Alloys of the Nickel-Tantalum Binary System.** I. I. Kornilov and E. N. Pylaeva. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 841-843 + 1 plate.

Nickel tantalide phase found to have a hexagonal lattice. Methods of study. Micrographs. (N9, M24, Ni, Ta)

28-N. (French.) **The Isothermal Transformation of Austenite and the Distribution of Alloying Elements in Low-Alloy Steel.** Axel Hultgren. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 737-760.

Various types of transformations have been distinguished and their kinetics determined from time-temperature-transformation diagrams, micro-examination of the transformation products and diffraction study and chemical analysis of carbides separated by electrolytic means. Tables, graphs, micrographs. (To be continued.) (N8, AY)

29-N. (Russian.) **Structure of Austenite at High Temperatures.** I. A. Oding and M. G. Lozinskii. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 1035-1043.

Appearance of plane blocks in austenite grains and increased chemical heterogeneity occurring after heating to high temperatures. Diagrams, micrograph. 9 ref. (N8)

30-N. Causes of the Effect of Small Dissolved Admixtures on the Kinetics of the Aging of Alloys. V. I. Arkharov, B. N. Varskoi and N. N. Skornyakov. *National Science Foundation Translation,* no. 45, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 1003.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Observations on strong accelerating effect of antimony on aging of many silver and copper alloys. Table, graphs. 6 ref. (N7, Ag, Cu, Sb)

31-N. Displacement of Grain Boundaries in Annealed Metal. I. A. Oding, M. G. Lozinsky and S. G. Fedotov. *National Science Foundation Translation,* no. 73, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953. p. 75-77.) Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 25-N, 1954. (N3, AY, Sn, Cu)

32-N. On the Effect of Certain Dissolved Admixtures on the Frontal Diffusion of Silver Into Polycrystalline Copper. V. I. Arkharov, S. I. Ivanovskaya and N. N. Skornyakov. *National Science Founation Translation,* no. 58, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 669-672.) Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 317-N, 1953. (N1, Cr, Ag)

33-N. On the Thermodynamics of Simple Carbides in Steel. N. S. Fastov and B. N. Finkel'shtein. *National Science Foundation Translation,* no. 77, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 677-679.) Available from Office of Techndical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 318-N, 1953. (N8, M27, ST)

34-N. Frontal Diffusion in Iron of Commercial Purity. V. I. Arkharov, K. A. Yefremova, S. I. Ivanovskaya, A. K. Shtolts and B. A. Yunikov. *National Science Foundation Translation,* no. 48, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 269.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Studies of diffusion of several elements into iron. Different shapes of the diffusion front observed. Micrographs. 6 ref. (N1, Fe)

35-N. A Method for Determining Diffusion Coefficients. S. N. Kryukov and A. A. Zhukovitsky. *National Science Foundation Translation,* no. 71, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 379-382.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Proposes a radioactive tracer technique for determining diffusion coefficients. Graphs. 4 ref. (N1, Ag)

36-N. Phase Changes During Electrospark Treatment of Metals and an Attempt to Establish Criteria for the Observed Interactions. L. S. Palatnik. *National Science Foundation Translation,* no. 53, Aug. 1953, 4 p. (Original in *Doklay Akademii Nauk SSSR,* v. 89, 1953, p. 455-458.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Structural changes in surface layer of various metals subjected to electrospark treatment in air for about 100 combinations of unlike electrodes. Tables, graph. 6 ref. (N6, Mg, Fe, Al, Ni, Cu, Zn, Cd, Sn, Pb)

37-N. The Temperature and Composition of the Beta-Alpha+Gamma$_2$ Eutectoid Reaction in Copper-Aluminium Alloys. D. L. Thomas and D. R. F. West. *Research (Supplement),* v. 6, Dec. 1953, p. 61S-62S.

Includes table. 5 ref. (N9, Cu, Al)

38-N. X-Ray Analysis of the Aging of Al-Zn Alloys. A. M. Yelistratov. *National Science Foundation Translation,* no. 65, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 803-806.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

A pure aluminum-zinc alloy, 25% zinc by weight, was studied. Samples were wires 0.1 to 0.5 mm. in diameter. They were quenched in ice water after heating at 44° C. for 2 hr. Grain sizes ranged from 0.1 to 0.02 mm. Micrographs. 6 ref. (N7, Al, Zn)

39-N. X-Ray Analysis of the Initial Stages of Aging of Beryllium Bronze. A. M. Yelistratov, S. D. Finkel'shtein, and T. Yu. Goldshtein. *National Science Foundation Translation,* no. 63, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 669-672.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Results of study of structural changes. Refers only to initial stages of aging before the alloy has reached maximum hardness and before lattice constant of the alpha phase has changed. Micrographs. 8 ref. (N7, Be, Cu)

40-N. Mobility of Impurity Ions in Germanium and Silicon. J. C. Severiens and C. S. Fuller. *Physical Review,* v. 92, ser. 2, Dec. 1, 1953, p. 1322-1323.

Mobilities of lithium and copper investigated to secure information on their state of ionization and their diffusivities in germanium and silicon. Graph. 4 ref. (N1, Li, Cu)

41-N. (Russian.) **Nature of Martensite.** B. A. Apaev. *Doklady Akademii Nauk SSSR,* v. 93, no. 4, Dec. 1, 1953, p. 647-649.

Magnetic method used to show that electrolytic precipitate of a hardened specimen is not martensitic carbide but a finely dispersed martensite powder. Graphs. 3 ref. (N8, ST)

P

Physical Properties and Test Methods

27-P. Rate of Displacement of Silver From Aqueous Silver Nitrate by Zinc and Copper. Richard Glicksman, H. Mouquin and Cecil V. King. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 580-585.

Displacement rates measured by rotating cylinders of zinc and copper in silver nitrate solutions for short-time intervals, followed by analysis of the solutions for silver ion content. Graphs. 12 ref. (P13, Ag, Cu, Zn)

28-P. Equilibrium Thermochemistry of Solid and Liquid Alloys of Germanium and of Silicon. I. The Solubility of Ge and Si in Elements of Groups III, IV and V. Carl D. Thurmond. **II. The Retrograde Solid Solubilities of Sb in Ge, Cu in Ge, and Cu in Si.** Carl D. Thurmond and J. D. Struthers. *Journal of Physical Chemistry,* v. 57, Nov. 1953, p. 827-834; disc., p. 830, 834-835.

Activity and temperature coefficients; and solidus and liquidus curves. Graphs. 36 ref. (P12, N12, Ge, Si, Sb, Cu)

29-P. Metallurgy. III. Researches on Pure Metals. Strain Aging and Permeability of Silicon Iron Sheet. G. M. Leak, A. M. Sage and E. Ineson. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 557-559, 562.

Studies on very pure iron and closely controlled alloys to find answers to commercial problems. Photographs, table, graph. (P16, N7, CN)

30-P. (English.) **Anomalous Properties of Dilute Alloys.** J. Korringa. *Physica,* v. 19, no. 9, Sept. 1953, p. 816-820; disc. p. 820.

Presents evidence to show that influence of small amounts of manganese, for example, on the electrical resistivity of noble metals is governed by interaction between the conduction electrons. Grap. (P15, Mn, EG-c)

31-P. (French.) **Comparative Effect of Traction and Compression on the Magnetic Properties of Alloy Steel.** Georges Vidal and Pierre Lanusse. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 902-904.

Investigation on 0.10% carbon steel. Effects of traction and compression plotted for various values of the inductor field. Graphs. 3 ref. (P16, AY)

32-P. (French.) **Thermo-Electric Force of Alloys.** J. Friedel. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 561-565.

Proposes application of Mott's calculation for determining electrical resistance changes caused by polyvalent substitution impurities in monovalent metals. Calculation applied to copper and gold-base alloys. Tables, graphs. 20 ref. (P15, Cu, Au, Mg, Si, Ti, Cr, Mn, Fe, Ni, Zr, Sn, W)

33-P. (French.) **The Determination of Optical Constants of Solid Metals Made by Means of Thick Plate.** D. Male and P. Rouard. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 584-587.

Investigations showing that the differences obtained with respect to optical constants from vapor-deposited layers and solid metals are due to differences in structure rather than the quality of the methods. Tables. 12 ref. (P17, L25)

34-P. (French.) **The Forces of Polarizability in the Crystals.** A. Herpin. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 611-620.

Effect of ion polarizability on the evaluation of interionic forces in an ionic crystal. 17 ref. (P15, Cu, Ag, Al)

35-P. (German.) **Aging Tests on Bar-Shaped Permanent Magnets at Different Temperatures.** Klaus Kronenberg. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 441-446.

Investigation of the aging effect of temperature (500 to −190° C.) on the pseudoremanence of different magnetic metals and alloys. Graphs, diagram, table. 19 ref. (P16, N7, AY, Al, Co, Cr, Ni)

36-P. (German.) **Transition of Heat by Means of Free Convection in Metal Melts.** Hans Klein. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 450-456.

Reviews existing data. Compares them with practical results on zinc. Usual differential formula of heat conduction evaluated critically. Tables, graphs. 18 ref. (P12, P11, Zn)

37-P. (German.) **Anisotropy of the Absolute Thermo-Electric Voltage of Tin Between 0 and 280 C.** Frauke Cirkler. *Zeitschrift für Naturforschung,* v. 8a, no. 10, Oct. 1953, p. 646-659.

Calculations on eight extremely pure monocrystal rods. Production of specimens and experimental arrangement. Results compared with theoretical data of various authors. Tables, graphs. 21 ref. (P15, Sn)

38-P. (German.) **The Effect of Capacitatively Arranged Boundary Fields Upon the Conductivity of Thin Semiconductor Layers.** K. Zückler. *Zeitschrift für Physik,* v. 136, no. 1, 1953, p. 40-51.

Reports on measurements on thin Se and CuO_2 layers at room temperature and at −78 and +80° C. Results used as a basis for a new method for determining density of holes and mobility. Applicability of method. Graphs. 9 ref. (P11, Se)

39-P. (Russian.) **Electroconductivity of Metals at a Large Current Density.** E. S. Borovik. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 771-774.

Deviations from Ohm's law for platinum, tungsten and copper under various current densities. Tables, graphs. 4 ref. (P15, Cu, W, Pt)

40-P. (Russian.) **Effect of Temperature on Light Absorption in Thin and Ultra Thin Layers of Silver.** A. G. Gumeniuk. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 783-786.

As a result of heating silver layers at 230° C., surface migration of particles leads to their coalescence and formation of metallic particles. Tables, graphs. 9 ref. (P17, Ag)

41-P. (Russian.) **Characteristics of the Superconducting Modification of Bismuth.** N. V. Zavaritskii. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 787-790.

Relationship was noticed between thinness of a specimen and its superconductivity. Temperatures of 6 to 10 or 11° K. were used to induce superconductivity. Diagram, graphs. 8 ref. (P15, Bi)

42-P. (Russian.) **Theory of Magnetizability of Thin Metal Layers at Low Temperatures.** I. M. Lifshits and A. M. Kosevich. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 795-798.

Magnetic properties of a metal of finite thickness. 10 ref. (P16)

43-P. (Russian.) **Phase Transformation by Method of Internal Friction.** K. M. Rozin and B. N. Finkel'shtein. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 811-812.

Comparison of internal friction changes and electrical resistance of a tempered specimen at 800° C. showed that in 2.5 hr. electrical resistance decreased by 1.3% while internal friction increased by 180%. Graphs. 2 ref. (P15, Q22)

44-P. (Russian.) **Certain Physical Properties of Pb-Sb Alloys.** V. A. Iurkov. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 891-893.

Results of investigations of linear expansion, density, electrical resistance, and thermo-electromotive force of lead-antimony alloys. Increase of antimony decreased the thermo-electromotive force. Graphs. 5 ref. (P10, P15, Pb, Sb)

45-P. (Russian.) **Melting Points of Tin and Lead Under Pressures up to 34000 Kg. Per Cm².** V. P. Butuzov and M. G. Gonikberg. *Doklady Akademii Nauk SSSR*, v. 91, no. 5, Aug. 11, 1953, p. 1083-1084.

Melting point increased with pressure. Lead reached a maximum of 532° C. Graphs, table. 4 ref. (P12, Pb, Sn)

46-P. Metal-Ceramic Interactions: II. Metal-Oxide Interfacial Reactions at Elevated Temperatures. G. Economos and W. D. Kingery. *American Ceramic Society, Journal*, v. 36, Dec. 1953, p. 403-409.

Interfacial reactions of various metals (Be, Mo, Nb, Ni, Si, Ti and Zr) with dense oxide specimens (Al_2O_3, BeO, MgO, ThO_2 and TiO_2) investigated at temperatures up to 1800° C. Photographs, tables, micrographs. 30 ref. (P10)

47-P. Neutron Capture γ-Rays From Heavy Odd-Charge Nuclei. G. A. Bartholomew and B. B. Kinsey. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1025-1050.

Neutron capture gamma ray spectra of As, Nb. Rh, Ag, In, Sb, Pr, Ta, Au, and Tl are described. Tables, graphs. 27 ref. (P10, As, Nb, Rh, Ag, In, Sb, Pr, Ta, Au, Tl)

48-P. Neutron Capture γ-Rays From Even-Charge Nuclei. B. B. Kinsey and G. A. Bartholomew. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1051-1086.

Neutron capture gamma-ray spectra of Se, Sr, Zr, Mo, Cd, Sn, Ba, Sm, Gd, W, Pt, and Hg. Graphs, tables. 59 ref. (P10, Se, Sr, Zr, Mo, Cd, Sn, Ba, Sm, Gd, W, Pt, Hg)

49-P. A Method for the Evaluation of Some Lattice Sums Occurring in Calculations of Physical Properties of Crystals. B. M. E. van der Hoff and G. C. Benson. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1087-1094.

Includes tables. 20 ref. (P general, M26)

50-P. The Decay of Cd^{105}. F. A. Johnson. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1136-1147 + 1 plate.

Isotope cadmium[105] (55 min.) has been produced by silver[107] (p, $3n$) reaction in the McGill University synchrocyclotron and has been investigated by means of a 180° spectrograph of high resolution, a lens spectrometer and a scintillation spectrometer. Tables, graphs. 17 ref. (P13, Cd, Ag)

51-P. A Note on the Ratio of the Quadrupole Moments of Li^6 and Li^7. N. G. Cranna. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1185-1186.

Includes diagram. 3 ref. (P10, Li)

52-P. Some Characteristics of Secondary Emission from BeCu. F. J. Fitz Osborne. *Canadian Journal of Physics*, v. 31, Nov. 1953, p. 1189.

Includes diagrams. (P17, Be, Cu)

53-P. High Temperature Materials for Vacuum Service. Herbert B. Michaelson. *Materials & Methods*, v. 38, Dec. 1953, p. 110-115.

Special properties required of materials for service in vacuum include low vapor pressure, stability, low gas permeability and ease of outgassing. Photographs, tables, graphs, diagram. 10 ref. (P10, P12, Q general, SG-h)

54-P. Progress Report on the NBS Permeameter. G. P. McKnight. *Metal Powder Association, Proceedings*, 1953, p. 6-12; disc., p. 12-13.

Principle of operation and several adaptations that have been made to make the instrument suitable for measuring iron core properties at high frequencies and to simplify the calculation of results. Photographs, diagrams, graphs. 5 ref. (P16, Fe)

55-P. A Method of Estimating Impurity Concentrations in Germanium. F. W. G. Rose and E. W. Timmins. *Physical Society, Proceedings*, v. 66, no. 407B, Nov. 1953, p. 984-986.

Resistivity of single samples of germanium has been measured in temperature range T = 100-400° K. using both d.c. and a.c. (3kc/s) methods. Graphs. 5 ref. (P15, Ge)

56-P. The Thermal Conductivity of Magnesium at Low Temperatures. W. R. G. Kemp, A. K. Sreedhar and G. K. White. *Physical Society, Proceedings*, v. 66, no. 407A, Nov. 1953, p. 1077-1078.

Includes graphs. 10 ref. (P11, Mg)

57-P. (English.) **Some Facts About Superconductivity.** C. J. Gorter. *Physica*, v. 19, no. 9. Sept. 1953, p. 745-752; disc., p. 752-754.

Various problems of superconductivity. Graphs. 27 ref. (P15)

58-P. (English.) **Superconductivity and Lattice Vibrations.** H. Fröhlich. *Physica*, v. 19, no. 9, Sept. 1953, p. 755-761; disc., p. 761-764.

Theory of isotope effect suggests that in superconductors. coupling between electrons and lattice displacements is stronger than in normal metals. 9 ref. (P15)

59-P. (English.) **The Coherence Concept in Superconductivity.** A. B. Pippard. *Physica*, v. 19, no. 9, Sept. 1953, p. 765-772; disc., p. 772-774.

Coherence as a fundamental property of a superconductor. Suggests the way in which it may influence electrodynamical behavior leading to modifications of the London theory. 15 ref. (P15)

60-P. (English.) **Thermal Conductivity of Superconductors.** K. Mendelssohn. *Physica*, v. 19, no. 9, Sept. 1953, p. 775-785; disc., p. 785-787.

Reviews present available information with emphasis on recent experimental findings. Graphs. 24 ref. (P11, Pb, Sn, Bi, In)

61-P. (English.) **The De Haas-Van Alphen Effect.** D. Shoenberg. *Physica*, v. 19, no. 9, Sept. 1953, p. 791-806.

Information obtained from comparison between experimental results and theory of magnetic susceptibility. New experiments at high fields. Table, oscillographs. 9 ref. (P16, Sn, Zn, Bi, Al, In, Ga, Cd, Tl, Be, Mg, Sb, Hg)

62-P. (English.) **Thermoelectricity at Low Temperatures.** G. Borelius. *Physica*, v. 19, no. 9, Sept. 1953, p. 807-814; disc., p. 814-815.

Several investigations on thermoelectric, resistometric and magnetic properties of various metals and alloys. Graphs. 20 ref. (P15, P16, Cu, Ag, Au, Cr, Mn, Fe, Co, Ni, Pd, Pt)

63-P. (English.) **Thermoelectric Power in Metals at Low Temperatures and Anomalous Impurity Scattering.** D. K. C. MacDonald. *Physica*, v. 19, no. 9, Sept. 1953, p. 841-845.

Marked deviations from theoretical predictions were found by experiments with thermo-electric power of alkali metals from 90° K. to liquid helium temperatures. Graphs. 6 ref. (P15, Sn, Ag, Cu, Bi, Ni)

64-P. (French.) **Variation of the Magnetic Permeability of Soft Steel Subjected to Periodic Stress.** Georges Vidal and Pierre Lanusse. *Comptes rendus*, v. 237, no. 20, Nov. 16, 1953, p. 1213-1215.

Tests with a specimen of annealed, 0.12% carbon steel, indicating existence of a reversible maximum of magnetic permeability under tension and absence of a similar characteristic under compression. Diagrams. (P16, CN)

65-P. (Russian.) **Surface Tension and the Heat of Evaporation of Metals.** S. M. Zadumkin. *Doklady Akademii Nauk SSSR*, v. 92, no. 1, Sept. 1, 1953, p. 115-118.

Establishes connection between surface tension and heat of sublimation. Tables. 9 ref. (P10, P12)

66-P. (Russian.) **Properties of a Thinly Rolled Permalloy.** L. I. Rabkin and P. I. Iuzvinskaia. *Elektrichestvo*, 1953, no. 10, Oct., p. 63-67.

Results of experimental investigations of properties of sheet permalloy for medium and high frequencies. Graphs, diagram. (P16, Ni)

67-P. (Russian.) **Activity of Carbon and Oxygen in Fe-C-O Melts.** A. M. Samarin and R. A. Karasev. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1953, no. 8, Aug., p. 1130-1136.

Relationship between activity coefficients of carbon and oxygen and the dependence on carbon concentration. Tables, graphs. 3 ref. (P12, Fe)

68-P. (Russian.) **Investigation of Properties of Liquid Iron-Chromium Alloys by the Method of Electromotive Forces.** O. A. Esin and N. A. Vatolin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1953, no. 8, Aug., p. 1137-1142.

Properties of iron-carbon-chromium alloy of different compositions were investigated at 1460° C. Tables, graphs. 10 ref. (P general, Fe, Cr)

69-P. An Acoustic Study of the Delta *E*-Effect and the Damping of the Elastic Waves in Polycrystalline Nickel. V. P. Sizov. *National Science Foundation Translation*, no. 31, July 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 427.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Results of an experimental study of effect of magnetic field and elastic stresses in polycrystalline nickel. Graphs. 6 ref. (P16, Q21, Ni)

70-P. Magnetic Moments and the Crystal Structure of Ferromagnetic Metals and Alloys. F. Galperin. *National Science Foundation Translation*, no. 68, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR*, v. 88, 1953, p. 643-646.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Simple formula previously proposed for magnetic moments of ferromagnetic metals and other ferromagnets can be generalized to ferrites and to similar chemical compounds in satisfactory agreement with experiment. Tale, graph. 12 ref. (P16, M26, Mn, Fe, Co, Ni, Cu, Mg, Zn)

71-P. Measurements of Melting Points of Metals Under Extremely High Pressures. V. P. Butuzov, M. G. Gonikberg and S. P. Smirnov. *National Science Foundation Translation*, no. 76, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 651-653.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 511-P, 1953. (P12)

72-P. A Study of the Effect of Pressure on Magnetic Saturation of Iron at the Temperature of Liquid Nitrogen. F. Galperin, S. Larin and A. Shishkov. *National Science Foundation Translation*, no. 36, July 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR*, v. 89, 1953, p. 419.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Experiments conducted at −196° C. and 20° C. Gas which does not solidify at 77° K. and 2000 atmospheres was used as compressing medium. Table, diagrams. 7 ref. (P16, Fe)

73-P. Thermoelectric Power of Monovalent Metals at High Temperature. D. K. C. MacDonald and S. K. Roy. *Philosophical Magazine*, v. 44, 7th ser. no. 359, Dec. 1953, p. 1364-1370.

Band theory of metals applied to analyze thermo-electric power of "simple" metals at high temperatures. Graphs, tables. 5 ref. (P15)

74-P. Search for the Hall Effect in a Superconductor. I. Experiment. H. W. Lewis. *Physical Review*, v. 92, ser. 2, Dec. 1, 1953, p. 1149-1151.

A search for Hall effect in superconducting vanadium proved negative but an upper limit of 150 x 10^{-8} electromagnetic units was established. 3 ref. (P15, V)

75-P. (Russian.) **Ferromagnetic Resonance of Nickel-Zinc Ferrites.** E. I. Kondorskii and N. A. Smol'kov. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 237-240.

Ferrites investigated were in form of solid solutions. Specimens were machined by abrasives and had the aspect of washers with a thickness of 1.00-1.03 mm. with an external diameter of 16 mm. and an internal diameter of 5 mm. Diagram, graphs, table. 10 ref. (P16, Ni, Zn)

76-P. (Russian.) **Resonance Absorption in Metals in Centimetric Waves.** S. G. Salikhov. *Doklady Akademii Nauk SSSR*, v. 93, no. 2, Nov. 11, 1953, p. 241-244.

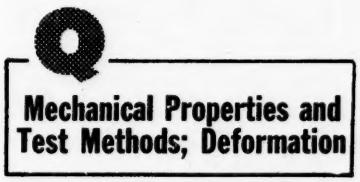
Results of measurement of resonance absorption in 28 paramagnetic and composite-diamagnetic metals at temperatures of 290 and 90° K. on a frequency 9.378×10^9 cycles per sec. Data obtained on the form and intensity of lines of paramagnetic absorption differ appreciably from results of measurements on low frequencies. Table, graphs. 5 ref. (P16)

77-P. (Russian.) **Heat Conductivity of Ferromagnetic Metals at Low Temperatures.** A. I. Rezanov and V. I. Cherepanov. *Doklady Akademii Nauk SSSR*, v. 93, no. 4, Dec. 1, 1953, p. 641-644.

Calculations of thermal resistance at low temperatures. Comparisons made with thermal resistance of the ionic lattice. 3 ref. (P11)

78-P. (Book—German.) **(Industrial Heat Transfer.) Der industrielle Wärmeübergang.** A Schack. Ed. 4. 400 p. 1953. Verlag Stahleisen, Dusselfdorf, Germany. 38.50 D.M.

Several theories on heat transfer by convection are compared, for laminar flow and for turbulent flow along plates, in tubes and through banks of tubes. Heat transfer by condensing vapors. Radiation from solid bodies, from clear furnace gases and from luminous flames is discussed. Detailed attention is given to the calculation of heat exchangers, such as recuperators and regenerators. The section on the mechanism of heat transfer in industrial furnaces is rather brief. The section on the relation between pressure drop and heat transfer is very good.—W. Trinks. (P11)



60-Q. Steel Testing and Design. II. W.A. Martin. *Canadian Metals*, v. 16, Dec. 1953, p. 36, 38.

Tests for determination of strength and ductility. 8 ref. (To be continued.) (Q23, ST)

61-Q. Some Considerations in Steel Testing and Design. W. A. Martin. *Canadian Metals*, v. 16, 1953, p. 42, 44.

Design practice, embrittlement, mechanical tests and transition temperatures. 3 ref. (Q general, ST)

62-Q. Fatigue Testing of Wire Ropes. U. Rossetti. *Engineers' Digest*, v. 14, Nov. 1953, p. 425-426, 444. (Translated from *l'Ingegnere*, v. 27, no. 7, July 1953, p. 769-771.)

Apparatus which can be used for standard fatigue strength tests, as well as for the determination of the effects of different types of dynamic load conditions. Diagrams, tables. (Q7)

63-Q. A Survey of Rapid Fatigue Test Methods. G. Vidal. *Engineers' Digest*, v. 14, Nov. 1953, p. 433-435. (Translated from *La Recherche Aeronautique*, no. 34, July-Aug. 1953, p. 49-54.)

Concludes no accelerated method gives a reliable indication of the fatigue limit. However, with caution, some of these methods may be used as approximations, thereby reducing the number of tests required by the strict method. Graphs, diagrams. 14 ref. (Q7)

64-Q. Calculating Flexibility for Straight Line Piping Elements. L. E. Partch. *Heating, Piping & Air Conditioning*, v. 25, Dec. 1953, p. 74-77.

Includes diagrams, photographs. (Q23)

65-Q. Some Creep Characteristics of a Group of Precipitation-Hardening Alloys Based on the Alpha-Copper-Aluminium Phase. J. P. Dennison. *Institute of Metals, Journal*, v. 82, Nov. 1953, p. 117-128.

Hardness and metallographic data used to investigate structural changes occurring on reheating solution-treated alloys, including specimens cold worked before aging. Graphs, tables. (Q3, Cu)

66-Q. In Carburized Bars—How to Develop Favorable Stress Patterns. II. J. E. Campbell and H. O. McIntire. *Iron Age*, v. 172, Nov. 26, 1953, p. 102-105.

Patterns determined for pack, gas, and liquid carburized bars after various quenching and tempering treatments. Graphs, tables. (Q25, J28, CN)

67-Q. How to Improve Bending Properties of Titanium Strip. W. M. Baldwin, Jr. *Iron Age*, v. 172, Dec. 3, 1953, p. 165-167.

Embrittlement resulting from oxygen and nitrogen absorption during annealing or hot rolling corrected by removing a thin layer of surface metal by grinding or pickling. Graphs. 4 ref. (Q5, J23, Ti)

68-Q. A Crystallographic Analysis of the Ductile-Brittle Transition in Body-Centered Cubic Single Crystals. A. J. Opinsky. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1650-1651.

Laws of critical normal stress for cleavage and critical shear stress for slip explain orientation and temperature dependence of transition in metals. Diagrams. 3 ref. (Q24)

69-Q. After-Effects in Polycrystalline Cadmium. Charles S. Barrett. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1652-1654.

Torsional after-effect is interrupted by an abnormal twisting when film on wire is removed by etching. This is accounted for by the pile-up of dislocations beneath the film during original twisting and relief of residual stresses by elastic and plastic processes during etching. Graph. 8 ref. (Q1, Cd)

70-Q. Torsional After-Effect Measurement and Applications to Aluminum. C. S. Barrett, P. M. Aziz and I. Markson. *Journal of Metals*, v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1655-1661.

Abnormal after-effect in twisted wires that occurs when untwisting is interrupted by etching can be brought under control and used to study the mechanical properties of thin surface-films and how they are affected by reagents and heat treatment. Results of studies of oxide films on high-purity aluminum. Graphs, diagrams. 4 ref. (Q1, Al)

71-Q. Band Structure in Disordered Alloys and Impurity Semiconductors. Hubert M. James and Arthur S. Ginzbarg. *Journal of Physical Chemistry*, v. 57, Nov. 1953, p. 840-847; disc., p. 847-848.

Mathematical analysis of a one-dimensional model. Graphs. 14 ref. (Q24, N10)

72-Q. Creep Tests in Inert Atmospheres. A. J. Fenner and G. Willoughby. *Journal of Scientific Instruments*, v. 30, Nov. 1953, p. 406-407.

Construction and operation of apparatus using rhomb and mirror extensometers of the kind widely used for high-sensitivity creep tests in air. Diagram, photograph. (Q3)

73-Q. Metallurgy. II. Fatigue Properties of Steels. J. Clayton-Cave and E. Ineson. *Metal Treatment and Drop Forging*, v. 20, Nov. 1953, p. 553-556.

Research program and facilities of the BISRA. Photographs, diagrams. (Q7, A9, ST)

74-Q. The Measurement of Engine Wear by the Use of Radio-Isotopes. *Petroleum*, v. 16, no. 12, Dec. 1953, p. 358-361.

Precautionary measures and test equipment and procedures. Graph, photographs. (Q9, S19)

75-Q. A Quantitative Study of the Wear Process. E. Rabinowicz. *Physical Society, Proceedings*, v. 66, no. 407 B, Nov. 1953, p. 929-936.

Determination of the mass of wear fragments using autoradiographic techniques. Graphs, diagrams. 7 ref. (Q9, Cu, CN)

76-Q. Finite Plane Strain. J. E. Adkins, A. E. Green and R. T. Shield. *Royal Society of London, Philosophical Transaction*, v. 246, ser. A, no. 910, Oct. 29, 1953, p. 181-213.

General theory of plane strain, valid for large elastic deformations of isotopic materials. 22 ref. (Q21)

77-Q. Effects of Alternating Strain on the Structure of Metal. W. A. Wood and R. B. Davies. *Royal Society, Proceedings*, v. 220, ser. A, Nov. 10, 1953, p. 255-266 + 3 plates.

Effects on crystalline structure of successive unidirectional tensile strains are compared with effects of the same strains applied alternately in tension and compression. Graphs, diffraction patterns. 8 ref. (Q27, Q28, M26, Cu)

78-Q. (English.) Alloy Steels. A Survey Given at the 4th International Mechanical Engineering Congress, June 5th, 1952. Helmer Nathorst. *Metalen*, v. 8, no. 20, Oct. 31, 1953, p. 363-367.

Yield point and elastic limit of austenitic stainless steels and effect upon machinability. Graphs, micrographs. 21 ref. (Q23, G17, SS)

79-Q. (German.) Problems of Standardizing Hardness Testing. E. Kruse. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 10, Oct. 1953, p. 295-299.

Definitions of terms, testing methods, equipment and correlation between hardness and other properties. Graph. (Q29, ST, Al, Be)

80-Q. (German.) Creep Strength and Embrittling of Ferritic Steels at 550° C. E. Theis. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 10, Oct. 1953, p. 300-315.

Testing procedure and results for determining effects of composition and heat treatment on creep strength of 15 steels. Photographs, tables, diagrams, graphs. (Q3, Q23, J general, SS)

81-Q. (German.) The Preparation and Investigation of Pure and Intentionally Contaminated Iron. Johan D. Fast. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1484-1496.

Effects of various impurities on strain aging, blue brittleness, and grain boundary brittleness. Diagrams, photographs, tables, graphs. 39 ref. (Q23, Fe)

82-Q. (German.) The Development of Heat Resisting Steels Showing High Strength at Elevated Temperatures. Karl Bungardt. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1496-1503.

Factors effecting creep behavior and corrosion resistance of steels. Tables, graphs. 13 ref. (Q3, R general, AY)

83-Q. (German.) Phenomena Encountered in Stressing Materials by Fatigue. Max Hempel and Eduard Houdremont. *Stahl und Eisen*, v. 73, no. 23, Nov. 5, 1953, p. 1503-1511.

Determination of reliable bases for calculating behavior of materials under different stress conditions. Changes in structure of soft steel after cold deformation and alternate stressing. Graphs, micrographs, diagrams. 11 ref. (Q7, M27, ST)

84-Q. (German.) Improving the Plastic Compression Test by Forced Glide Friction. Ernst Mönch. *Zeitschrift für angewandte Physik*, v. 5, no. 10, Oct. 1953, p. 363-369.

New method used for celluloid but also applied to aluminum. Purpose of experiments, experimental arrangement, preparation of specimens and results. Photographs, micrographs, graphs. 5 ref. (Q28, Al)

85-Q. (German.) The Laws of Plastic Deformation of Metals Under a Multiaxial State of Tension. I. Theoretical Basis. Werner Sautter, Albert Kochendörfer and Ulrich Dehlinger. *Zeitschrift für Metallkunde*, v. 44, no. 10, Oct. 1953, p. 442-449.

Experimental investigations on combined tension and torsion tests of aluminum tubes and on their theoretical interpretation on the basis of known plasticity theories. Graphs. 30 ref. (Q24)

86-Q. (Hungarian.) Defects of Surface and Quality of Steel Wire. Lajos Mankher. *Kohaszati Lapok*, v. 8, no. 11, Nov. 1953, p. 225-239.

Conditions to be fulfilled by basic material as well as mechanical and technological properties of drawn wire resulting from structural changes taking place during processing. Photographs, micrographs. (Q general, F28, AY)

87-Q. (Italian.) Shear Strength Test of Light Metals. F. Gatto. *Alluminio*, v. 22, no. 5, Oct. 1953, p. 495-506.

Testing method which demonstrates value of shear breaking load. Photo-elastic examination of stress conditions of the sample indicated value of the test. Tables, photographs, micrographs, diagrams. (Q2, Cu, Mg, Zn)

88-Q. (Italian.) An Electro-Acoustic Method for Measuring Thermo-Elasticity. F. Gatto. *Alluminio*, v. 22, no. 5, Oct. 1953, p. 507-521.

Application of method to measuring elastic constants, hardness and recrystallization of aluminum. Tables, graphs, photographs, diagrams. 22 ref. (Q21, Q29, N5, Al)

89-Q. (Russian.) Internal Friction and Shear Modulus of Pure Copper and Beryllium Bronze. V. S. Postnikov. *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 79-82.

Studies on internal friction and shear modulus as depending on temperature and soaking time. Graphs. 6 ref. (Q22, Q2, Cu, Be)

90-Q. (Russian.) Intermittent Deformation on the Linear "Elastic" Portion of the Tensile Strength Diagram. N. F. Siutkin. *Doklady Akademii Nauk SSSR*, v. 91, no. 1, July 1953, p. 83-85.

Testing on aged and tempered wire. Tempering was done at 375° C. in 15° C. water and aging time was 250 hr. Graphs. 3 ref. (Q27)

91-Q. (Russian.) Problem of the Nature of the Fracture Strength of Metals. V. A. Pavlov. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 253-255.

Studies of the change of metal properties during plastic deformation by measuring the ratio of impact strength to the magnitude of plastic deformation. Graphs. 4 ref. (Q26, Q24, Q6)

92-Q. (Russian.) Microhardness of Difrused Silicon Coatings. N. S. Gorbunov, A. S. Akopdzhanian and N. A. Izgaryshev. *Doklady Akademii Nauk SSSR*, v. 91, no. 2, July 11, 1953, p. 285-286.

The greater the amount of carbon in the covered metal the greater the microhardness of the diffused silicon coating. Graphs, micrographs. 3 ref. (Q29, L15)

93-Q. (Russian.) Complex Manifestation of Plastic Deformation of Monocrystals. A. B. Zemtsov, M. V. Klassen-Nekliudova and A. A. Urusovskaia. *Doklady Akademii Nauk SSSR*, v. 91, no. 4, Aug. 1, 1953, p. 813-816 + 1 plate.

Translucence of thallium bromide and thallium iodine in visible rays and possibility of studying them in polarized light permitted demonstration of mechanics of deformation. Micrographs, diagrams. 8 ref. (Q24, Tl)

94-Q. (Russian.) Influence of the Size Relationship of Friction Surfaces and Degree of Hardness on the Slide Conditions of Machine Parts in Contact. D. N. Garkunov and I. V. Kragel'skii. *Doklady Akademii Nauk SSSR*, v. 91, no. 5, Aug. 11, 1953, p. 1085-1088.

Friction pairs such as copper on aluminum, steel on aluminum and steel on chromium steel. Diagrams, tables, graphs, micrographs. 3 ref. (Q9, Al, Cu, St, CN)

95-Q. (Russian.) Study of the Deformed State With the Help of Radioactive Isotopes. S. I. Gubkin and S. A. Dovnar. *Doklady Akademii Nauk SSSR*, v. 91, no. 5, Aug. 11, 1953, p. 1089-1090.

Radiographs permit examination of degree of change at each point and main direction of deformation at its terminal moment. Method shown to be particularly valuable for terminal plastic processes. Micrograph. (Q24, S19)

96-Q. (Russian.) Investigation of Wear of Piston Rings. R. V. Kugel. *Vestnik Mashinostroeniia*, v. 33, no. 8, Aug. 1953, p. 32-36.

Problem of a more rational chromium plating of oil rings. Diagrams, tables. 5 ref. (Q9, L17)

97-Q. Some Notes on Creep of High Temperature Alloys. W. T. Pether. *Australasian Engineer*, 1953, Oct., p. 95-99, 101, 103, 105, 107, 109.

Resumé of a paper presented to the Foundry and Metals Institute of Western Australia. (Q3)

98-Q. Brinell Hardness Numbers for Various Loads. Vincent E. Laysaght. *Materials & Methods*, v. 38, Dec. 1953, p. 145.

Data sheet reprinted from "Indentation Hardness Testing," Reinhold Publishing Corp., 1949. (Q29)

99-Q. Work Hardening of Metals. *Metal Industry*, v. 83, Nov. 27, 1953, p. 446.

Slip and theories of cold work hardening. 3 ref. (Q24)

100-Q. A Progress Report on Brass. D. C. Bradley and W. R. Toeplitz. *Metal Powder Association, Proceedings*, 1953, p. 69-76; disc., p. 76-77.

Mechanical properties of pure iron and various copper alloys. Precautions necessary for production of satisfactory parts. Photographs, graphs. (Q general, H general, Cu, Zn, Pb, Sn, Fe)

101-Q. Alloy Powders by the Hydride Process. B. A. Gruber. *Metal Powder Association, Proceedings*, 1953, p. 95-99; disc., p. 99-101.

Mechanical properties of chromi-

um-nickel alloy steels made from powders. Tables, graphs.
(Q general, H general, Cr, Ni, AY)

102-Q. American Developments in Alloys for High Temperatures. C. L. Clark. *Metal Progress,* v. 65, Jan. 1954, p. 72-76.

Compositions and mechanical properties of low and high-alloy steels and other heat resistant alloys. Graphs, tables.
(Q general, SS, SG-h)

103-Q. How Tough Are Nickel and Chromium Electroplates for Aluminum? Henry Paige, J. H. James and F. S. Williams. *Product Engineering,* v. 24, Dec. 1953, p. 162-167.

Value of nickel and chromium electroplated high-strength Al has been revealed in a series of corrosion and mechanical strength studies. Tables, graphs, photographs.
(Q general, R general, Ni, Cr, Al)

104-Q. A Comparison Between the Swift Cupping Press and the Tensile Test for the Assessment of the Aluminium-Magnesium Series of Alloys for Deep Drawing and Pressing. Roger Pearce. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1077-1080.

Investigation to examine all commercial aluminum-magnesium alloys in all their conditions to discover which is the best to use for mass-production press work. Tables, photograph, diagram. (Q23, Mg, Al)

105-Q. Thorium Improves Magnesium Alloys. *Steel,* v. 133, Dec. 14, 1953, p. 126, 128.

Castings made with experimental alloys indicate they will be easier to handle than rare earth alloys. Thorium makes alloying with zirconium easier and ups recoveries. Tables. (Q general, Mg)

106-Q. Steel Below Zero. O. A. Battista. *Steelways,* v. 9, Dec. 1953, p. 28-31.

Studies in effects of low temperatures on steels. Photographs, diagram. (Q general, ST)

107-Q. A Study of Elastic and Plastic Stress Concentration Factors Due to Notches and Fillets in Flat Plates. Herbert F. Hardrath and Lachlan Ohman. *U. S. National Advisory Committee for Aeronautics, Report* 1117, 1953, 10 p.

Six large 24S-T3 aluminum alloy sheet specimens containing various notches or fillets were tested in tension to determine their stress concentration factors in both elastic and plastic ranges. Diagrams, graphs, table. 12 ref.
(Q21, Q23, Q25, Al)

108-Q. Experimental Stress Analysis of Stiffened Cylinders With Cutouts. Pure Torsion. Floyd R. Schlechte and Richard Rosecrans. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3039, Nov. 1953, 41 p.

Torsion tests made on a cylindrical semimonocoque shell of circular cross section. Diagrams, graphs, photographs, tables. 5 ref. (Q25, Al)

109-Q. Application of Silver Chloride in Investigations of Elasto-Plastic States of Stress. L. E. Goodman and J. G. Sutherland. *U. S. National Advisory Committee for Aeronautics, Technical Note,* 3043, Nov. 1953, 55 p.

Quantitative relationships between the state of elastic or plastic stress in a specimen and observed relative retardation and extinction angle developed from a general theory of stress birefringence. Micrographs, graphs, tables. 22 ref. (Q25)

110-Q. Behavior of Carbon and Low-Alloy Steels Between −20 and +650° F. G. H. Enzian. *Welding Journal,* v. 32, Dec. 1953, p. 605s-618s.

Demonstrates that certain pressure vessel steels may be susceptible to phenomenon of brittleness in these temperature ranges. Appropriate precautions to be observed in critical applications. Graphs, tables. 59 ref. (Q23, CN, AY)

111-Q. (French.) Steels Resistant to Temperatures Greater Than 450° C. I. Georges Vidal. *Chaleur & Industrie,* v. 34, no. 340, Nov. 1953, p. 305-314.

Resistance to creep; structural stability; resistance to oxidation by air or to corrosion by certain industrial atmospheres; resistance to abrasion; and resistance to alternating stresses. Micrographs, photographs, diagrams, graphs. (To be continued.) (Q3, R3, AY, SS, Ni)

112-Q. (French.) The Presence of Preferred Micro-Domains of Attack in a Copper-Zinc Polycrystalline Solid Solution Very Slightly Deformed by Tension. Pierre A. Jacquet. *Comptes rendus,* v. 237, no. 20, Nov. 16, 1953, p. 1248-1250.

Slip lines scarcely visible on electrolytically polished surface are revealed by a special etching technique. (Q24, Cu, Zn)

113-Q. (French.) Comparative Study of the Wear of Materials Subjected to Friction. R. de Fleury. *Revue de l'Aluminium,* v. 30, no. 203, Oct. 1953, p. 341-345.

Endurance criterion of materials submitted to friction is the work that the material can elastically absorb per unit volume. Diagram. 6 ref. (Q9, Al, ST)

114-Q. (French.) The Study of Foundry Alloy A-Z5G. Louis Grand. *Revue de l'Aluminium,* v. 30, no. 204, Nov. 1953, p. 385-390.

Mechanical properties, workability and corrosion resistance. Tables, graphs, photographs.
(Q general, R general, Al, Zn, Mg)

115-Q. (French.) Rotating Bending Tests on Specimens of Medium Size. P. Coron. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 761-767.

Machine designed to carry out tests to compare cracks of forged and machined crankshafts and to examine effect of metallic coatings on behavior of axles in service. Diagrams, micrographs. 32 ref. (Q5)

116-Q. (Italian.) Fatigue Tests on Steel Softened by Cold Straining. L. Matteoli and B. Andreini. *Metallurgia italiana,* v. 45, no. 9, Sept. 1953, p. 328-337.

Heat treated steels possess a noticeable degree of hardness even at slight cold deformation. Hypotheses advanced to clarify causes of the phenomenon. Graphs, tables. 11 ref. (Q7, ST)

117-Q. (Russian.) Influence of Change of Deformation Rate on Plastic Stretching. L. I. Vasil'ev, A. S. Bylina and M. P. Zagrebennikova. *Doklady Akademii Nauk SSSR,* v. 90, no. 5, June 11, 1953, p. 767-769.

Importance of rate on continued deformation. Graphs. 3 ref.
(Q24, Cu, Sn)

118-Q. (Russian.) Resistance of Metals to Plastic Deformation. Iu. I. Iagn and I. A. Chaplinskii. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1023-1026.

Tests conducted on pure iron, steels and aluminum bronze. Graphs. 5 ref.
(Q24, Fe, CN, AY, Al)

119-Q. (Russian.) Role of Grain Boundaries in the Process of Plastic Deformation of Aluminum. E. S. Iakovleva and M. V. Iakutovich. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1027-1029 + 1 plate.

Effects of changing conditions of deformation. Micrographs. 9 ref.
(Q24, Al)

120-Q. (Russian.) Calculation of Strength of Jointed Eccentric Pipes and Conduits. Determination of Stresses in Jointed Pipes Caused by Press Fitting and Stresses in a Semiplane With a Circular Hole. N. D. Tarabasov. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 949-963.

Formulae for component stresses. Diagrams, tables. 6 ref. (Q25)

121-Q. (Russian.) Poisson's Ratio During Stress Relaxation. B. M. Rovinskii and V. G. Liuttsau. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1471-1474.

Room temperature tests gave a value of 0.488 to 0.499 for aluminum and 0.416 to 0.493 for copper. Graphs, table. 3 ref. (Q21, Al, Cu)

122-Q. (Spanish.) Application of Metallography to a Study on the Rupture of Tension-Test Specimens. José Izaguirre Cobo. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 8 p.

Influence of various chemical elements on mechanical properties of chromium-nickel stainless steel. Tension tests. Micrographs, diagrams (Q27, SS, Cr, Ni)

123-Q. Bauschinger Effect by Torsion of Copper Wires. M. J. Druyvesteyn and C. F. Etienne. *Applied Scientific Research,* v. 4, sec. A, no. 2, 1953, p. 100-104.

Influence of amount of deformation, temperature and preliminary stretching. Graphs. 5 ref.
(Q24, Cu)

124-Q. Some Aspects of the Effect of Copper in Cast Iron and Steel. June A. McNicol. *Australasian Engineer,* 1953, Oct., p. 54-60.

Precipitation hardening, tensile properties, creep strength and fatigue and corrosion resistance of copper-bearing iron and steel. 17 ref.
(Q23, Q7, Q3, R general, N7, CI, AY)

125-Q. WADC Evaluates Magnesium: Good, But—. Irving Stone. *Aviation Week,* v. 59, Dec. 28, 1953, p. 34-37.

Designers and producers must take into account the light metal's sensitivity to "incorrect" handling. Photographs. (Q general, Mg)

126-Q. Materials for High Temperature Service. III. Howard C. Cross. *Industrial Heating,* v. 20, Dec. 1953, p. 2416, 2418, 2420.

Properties of various metals, alloys, cermets and ceramic materials. Graph. (To be continued.)
(Q general, Al, Mg, Ti, SG-h, SS, Co, Mo, Ni)

127-Q. Effect of Plastic Deformation on Subsequent Decomposition in Aluminum Alloys. N. N. Buinov and L. I. Podrezov. *National Science Foundation Translation,* no. 41, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 665.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Electron-microscopic analysis of an aluminum-silver alloy shows that the decomposition in the surface layer of the alloy differed from that in the interior. Micrographs. 9 ref.
(Q24, Ag, Al)

128-Q. Internal Friction and Shear Modulus of Pure Copper and Beryllium Bronze. V. S. Postnikov. *National Science Foundation Translation,* no. 86, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 79-82.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 89-Q, 1954.
(Q22, Q2, Cu, Be)

129-Q. Jumplike Deformation in the Linear "Elastic" Range of the Strain

Diagram. N. F. Syutkin. *National Science Foundation Translation,* no. 74, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 83-85.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Jumplike deformation observed in a zinc-aluminum alloy during elastic extension. Test equipment is described. Graphs. 3 ref. (Q21, Al)

130-Q. Some Data on the Relation of Relaxation and Rate Characteristics in Plastic Deformation. L. I. Vasilyev. *National Science Foundation Translation,* no. 33, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 451.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Tests made on wires of copper, nickel, copper-nickel alloy and tin. Graphs. 10 ref. (Q24, Cu, Ni, Sn)

131-Q. A Study of Isochromatic Lines in Transparent Models Under Finite Plastic Deformation. S. I. Gubkin and S. I. Dobrovolsky. *National Science Foundation Translation,* no. 83, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 799-802.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Pattern formed by the isochromatics determined by type of load, shape of the loaded body and apparatus employed. Micrographs. (Q24)

132-Q. Second-Order Elastic Deformation of Solids. D. S. Hughes and J. L. Kelly. *Physical Review,* v. 92, ser. 2, Dec. 1, 1953, p. 1145-1149.

Expressions for the velocities of elastic waves in stressed solids derived using Murnaghan's theory of finite deformations and third-order terms in the energy. Graphs, tables, diagrams. 14 ref. (Q21, Fe)

133-Q. (Hungarian.) **Present Status of the Testing of Iron Castings.** Tibor Lukacsfalvi. *Ontöde,* v. 4, no. 9, Sept., p. 196-201.

Necessity and usefulness of various tests, such as impact, fatigue limit, damping capacity and nondestructive. Diagrams, micrographs. 13 ref.

(Q6, Q7, Q8, S general, CI)

134-Q. (Book.) **Dislocations and Plastic Flow in Crystals.** A. H. Cottrell. 223 p. 1953. Oxford University Press, Amen House, Warwick Square, London E. C. 4, England, $5.00.

Includes chapters on interpretation of slip in crystals; elastic properties of dislocations; dislocations in crystals; theories of the yield strength; and work hardening, annealing and creep. (Q24)

135-Q. Fatigue of Metals. R. Cazaud. (Translated from French by A. J. Fenner.) 334 p. 1953. Philosophical Library, New York 16, N. Y. $12.50.

Comprehensive survey of behavior of metals under cyclic stresses. See also item 190-Q, 1953. Photographs, tables. (Q7)

136-Q. (Book.) **Stress Waves in Solids.** H. Kolsky. 211 p. 1953. Oxford University Press, Amen House, Warwick Square, London E. C. 4, England. $5.00.

Includes chapters on propagation in an extended elastic medium; propagation in bounded elastic media; experimental investigations with elastic materials; internal friction; experimental investigation of dynamic elastic properties; plastic waves and shock waves; and fractures produced by stress waves. (Q21, Q25)

R

Corrosion

28-R. Durimet 20—Carpenter 20. Walter A. Luce. *Chemical Engineering,* v. 60, Dec. 1953, p. 276, 278, 288.

Charts corrosion rates in a number of chemicals. Mechanical properties and some applications in the chemical industry. Photographs, tables, charts.
(R11, Q general, T29, SG-g)

29-R. Cathodic Protection and High Resistivity Soil. H. C. Van Nouhuys. *Corrosion,* v. 9, Dec. 1953, p. 448-458; disc., p. 458-459.

Pipeline system of 25 rectifiers in high-resistivity soils. Comparative tests between magnesium anodes and rectifiers. Photographs, maps, graphs, tables. 7 ref. (R10)

30-R. Corrosion of Steel in Dilute Solutions of Sodium Salts of Weak Acids. M. J. Pryor. *Corrosion,* v. 9, Dec. 1953, p. 467-477.

Rate and form of corrosion of steel in dilute solutions of anodic inhibitors. Photograph, tables, graphs. 19 ref. (R5, CN)

31-R. The Reaction of Silver Alloys With Sulfur in Mineral Oil. I. Kinetics. R. T. Foley, M. J. Bolton and W. Morrill. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 538-542.

Traces course of reaction of silver alloys with sulfur to determine the mechanism of tarnishing. Typical reaction course consisted of an initial rapid reaction similar to unalloyed silver followed by a linear steady-state phase. Graphs, tables. 10 ref. (R2, Ag)

32-R. Mechanism of Reaction of Aluminum and Aluminum Alloys With Carbon Tetrachloride. Milton Stern and Herbert H. Uhlig. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 543-552.

Proposes a reaction mechanism. Effects of alloying elements on induction period and corrosion rate. Diagram, graphs, tables. 17 ref. (R6, Al)

33-R. The Inhibition by Quinolines and Thioureas of the Acid Dissolution of Mild Steel. T. P. Hoar and R. D. Holliday. *Journal of Applied Chemistry,* v. 3, Nov. 1953, p. 502-513.

Dissolution of mild steel by warm sulphuric acid, with and without organic inhibiting additions, studied by simultaneous measurements of corrosion rate and corrosion potential, and by the determination of true anodic and cathodic polarization curves in the neighborhood of the natural corrosion potential. Graphs, diagrams. 25 ref. (R5, CN)

34-R. Corrosion in Refrigeration Systems Can Be Controlled. R. G. Rydell. *Refrigerating Engineering,* v. 61, Dec. 1953, p. 1330-1332, 1370-1372.

Water factors that produce corrosion and chemicals that will reduce or prevent it. Graphs, tables. (R4)

35-R. (Hungarian.) **The Effects of Grain Refining Additions and Alloying With Magnesium Upon Corrosion Resistance of High-Purity Aluminum.** Maria H. Gyenes. *Aluminium (Budapest),* v. 5, no. 11, Nov. 1953, p. 225-235.

Results of investigations with various highly corrosive media compared with data from literature. Tables, graphs, photograph. 24 ref. (R general, Al)

36-R. (Hungarian.) **Protection Against Corrosion of Pipelines.** Ferenc Zachemski. *Banyaszati Lapok,* v. 8, no. 11, Nov. 1953, p. 559-565.

Corrosion and protection of a Hungarian pipeline built in 1940-42. Examination, onset of corrosion, its course and repairs effected, causes of corrosion, galvanic reactions and measures against them. Tables, diagrams, graphs. 7 ref. (R10, AY)

37-R. (Russian.) **Catalytic Corrosion.** S. Z. Roginskii, I. I. Tret'iakov, and A. B. Shekhter. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 881-884 + 1 plate.

External effect of catalytic and sorption corrosion on surface structure. Table, micrographs. 7 ref. (R1)

38-R. Cooling System Corrosion Problems. R. S. Wise. *Diesel Power,* v. 31, Dec. 1953, p. 64-66.

Use of corrosion inhibitors in water-cooled diesel engines. Photographs, diagram. (R10)

39-R. There's Trouble Ahead if Utilities Fail to Coordinate Their Corrosion Control Measures. Hugh L. Hamilton. *Gas,* v. 29, Dec. 1953, p. 51-52.

(R general)

40-R. Cathodic Protection of Ferrous Metals. Heinrich Klas. *Metal Progress,* v. 65, Jan. 1954, p. 142-144.

Previously abstracted from *Stahl und Eisen.* See item 439-R, 1953. (R10, ST, CI)

41-R. Fight Corrosion. Profit From Your Own Experience. *Petroleum Processing,* v. 8, Dec. 1953, p. 1866-1869.

Broadened program of corrosion prevention, including better correlation of corrosion data, extended inspection of metals and avoidance of corrosion potentialities by design engineers. Charts. (R general)

42-R. Coordination of Corrosion Control. Hugh L. Hamilton. *Pipe Line News,* v. 25, Dec. 1953, p. 44, 46, 48.

Steps necessary for adequate coordination of corrosion. (R general)

43-R. (Italian.) **Corrosion by Differential Aeration. Research on Zinc.** G. Bianchi. *Metallurgia italiana,* v. 45, no. 9, Sept. 1953, p. 323-327.

Process can be controlled by diffusion of oxygen in the solution or by anodic control. Diagrams, photographs, graphs, table. 4 ref. (R10, Zn)

44-R. (Polish.) **Corrosion in Coke By-Products Industry.** H. Wolk-Laniewska. *Przemysl Chemiczny,* v. 9, no. 9, Sept. 1953, p. 486-491.

Various methods which require coordination for improvement of corrosion control. Tables, photographs, micrographs. (R general)

45-R. (Russian.) **Passivation and Activation of Magnesium in an Alkaline Solution.** E. V. Barelko and B. N. Kabanov. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1059-1062.

Tests made on 99.95% pure magnesium with chemically pure potassium hydroxide in distilled water. Graphs. 6 ref. (R10, Al)

46-R. (Spanish.) **Corrosion Test for Corrosion-Resistant Cr-Ni Austenitic Welded Steels (Proposal Drawn Up by the Commission 9 on Weldability of the International Welding Institute).** *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 2 p.

Outlines test for determining susceptibility of welded stainless steels to intercrystalline corrosion. Diagrams. (R11, K general, SS)

47-R. Mechanism of the Internal Corrosion of Water Pipe. Rolf Eliassen and James C. Lamb, III. *American Water Works Association, Journal,* v. 45, Dec. 1953, p. 1281-1294.

Effects of several variables and requirements for further research. Diagrams, graphs, tables. 9 ref. (R1)

48-R. Corrosion Proofing Vapour Phase Inhibitors. John P. Mosner. *Canadian Chemical Processing,* v. 37, Dec. 1953, p. 64.

Types, effects and applications of inhibitors. (R10)

49-R. New Techniques and Current Problems in Control of Underground Corrosion. O. C. Mudd. *Gas Age,* v. 112, Dec. 17, 1953, p. 46-51, 77-78. (Taken from paper presented before Pipe Line Symposium, American Petroleum Institute, Chicago, Ill. Nov. 10, 1953.)

Construction features, accessory equipment and choice of coatings. Diagrams, graphs, table. (R8)

50-R. (Book.) **Symposium on Fretting Corrosion.** 84 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.75.

A compilation of papers presented by W. E. Campbell; J. R. McDowell; Oscar J. Horger; E. W. Herbek, Jr., and R. F. Stohesher; H. H. Uhlig; W. D. Tierney; and A. W. McClellan. (R1)

51-R. (Book.) **Water Treatment.** 192 p. 1953. Houseman & Thompson, Ltd., D. M. House, Newcastle Upon Tyne, 2, England. 15s. ($2.25.)

Scales, deposits, pitting, and corrosion with their analyses and the analyses of the waters that caused them. (R4, R10)

S

Inspection and Control

32-S. Use of Gamma-Ray Emitters For Industrial Radiography. Herbert R. Isenburger. *American Foundryman,* v. 24, Dec. 1953, p. 46-48.

Properties, uses, testing procedures and safety precautions. Charts, tables. (S19)

33-S. Statistical Quality Control. The Introduction of a Form of Sampling Inspection. L. Griffiths. *Automobile Engineer,* v. 43, Nov. 1953, p. 453-458.

Reviews elementary statistical theory, control charts, control limits, sampling intervals and applications to automatic production. Graphs, tables. 12 ref. (S12)

34-S. The Use or Radioactive Isotopes in Metallurgy. R. Shuttleworth. *British Journal of Applied Physics,* v. 4, Nov. 1953, p. 326-329.

Applications in radiography; gaging thickness of foils and coatings; detecting minute amounts of labelled metals; and measuring self-diffusion coefficients. Tables. 25 ref. (S19)

35-S. Direct-Indicating Recording Instruments. II. S. R. Gilford. *Electrical Manufacturing,* v. 52, Dec. 1953, p. 120-128.

Basic operating principles. Design elements and frequency response of various commercial instruments analyzed, including null-type, moving-coil and photo-electric types with associated pen motors. Graphs, photographs, diagrams, table. 14 ref. (S16, S19)

36-S. Statistical Quality Control. A. J. Kukla. *Foundry,* v. 81, Dec. 1953, p. 120-124, 248-249.

Quality control procedures in sand control and melting and molding operations in foundries. Charts. (S12, E19, E10, Mg)

37-S. ASA Will Simplify Surface Roughness Measurements. F. W. Witzke. *Iron Age,* v. 172, Dec. 3, 1953, p. 180-182.

Use of arithmetic average microinch readings for surface roughness measurements are recommended in a proposed revision of American Standard ASA B.46 1953. Diagram, photographs. (S15)

38-S. Specifications Relating to Aluminium and Magnesium. *Light Metals,* v. 16, Nov. 1953, p. 368-370.

List of revisions to indexes and schedules of the specifications originally published in *Light Metals,* v. 16, 1953, p. 121. (S22, Al, Mg)

39-S. Mechanisms of Sleeve Bearing Failure. P. B. Burgess. *Lubricaton Engineering,* v. 9, Dec. 1953, p. 309-312.

Examination scheme for finding most probable failure mechanisms of damaged bearings. Discusses use of wide angled magnifier and magnetized pick or probe. Photographs. (S13)

40-S. How Form Tolerances Affect Gaging Requirements. III. Earle Buckingham. *Machinery,* v. 60, Dec. 1953, p. 180-185.

How tolerances on form—particularly tapers—are selected and how they determine the gaging requirements. Graphs, diagrams. (S14)

41-S. The Problem of Defining Micro-Geometrical Irregularities of Mechanical Parts. P. Nicolau. *Microtechnic (English Ed.),* v. 7, no. 5, 1953, p. 220-225.

Translated from the French. Attempt to standardize terms used in surface roughness measurement. Graphs, diagrams. (S15)

42-S. (German.) **The Resistometer as a Tester of the Protective Layer on Aluminum and Other Metals.** W. Ruff. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 462-464.

Working principle based on definition of ohmic resistance of film. Graphs, diagrams. (S13, Al)

43-S. (German.) **The Electrolytic Separation of Tin From Its Chlorine Compounds. II. Separation From Tin^{4} Salt Solutions.** Arnaldo Foschini. *Zeitschrift für analytische Chemie,* v. 139, no. 6, 1953, p. 408-412.

Investigations on uncoated and copper coated Winkler electrodes in presence and absence of ammonium oxalate. Tables. 3 ref. (S11, Sn)

44-S. (German.) **The Effect of Mechanical Stresses During Magnetic Induction Testing for Defects of Steel Pipes.** Kurt Matthaes. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 473-474.

Proposes method for suppressing mechanical stresses during such measurements by use magnetic-mechanical instruments. (S13, Q25, ST)

45-S. Liquid-Metal Sampling Apparatus. *Engineering,* v. 176, Dec. 4, 1953, p. 735.

Apparatus which enables furnace samples of steel or other metals to be produced in finely granulated or divided form directly from liquid state. Diagram. (S12)

46-S. TV for Industry. Norman J. Rivkees and Richard T. Kohler. *Industry and Power,* v. 65, Dec. 1953, p. 60-63.

Overlooking a freight yard or inside a steel furnace, a TV camera can give the operator a "bird's eye" view of what's going on in the plant. Photographs. (S18)

47-S. Cooling Water Commander. P. W. McRaven. *Instrumentation,* v. 7, no. 1, 1953, p. 10-13.

Control panel for continuously indicating oxidation inhibitor concentration, dissolved solids concentration, and pH of recirculated cooling water. Photographs, diagram. (S18, R10)

48-S. Advancing Process Control. C. W. Worley and G. W. McKnight. *Instrumentation,* v. 7, no. 1, 1953; p. 21-28.

System engineering that explains feedback control and one of its techniques, frequency response testing. Graphs, diagrams. (S18)

49-S. Nuclear Reactors for Industry and Research. IV. Radiation Protection. Karl Z. Morgan. *Instruments,* v. 26, Dec. 1953, p. 1872-1874, 1900-1903.

Includes tables, photographs. (S19)

50-S. A Steel-Plate Thickness Meter. S. S. Carlisle and R. B. Sims. *Instruments,* v. 26, Dec. 1953, p. 1880-1881, 1903-1904.

An instrument for measurement of the thickness of steel plates when only one face is accessible uses the total magnetic induction in body of plate at saturation. Development, construction and performance. Graphs, diagrams, photograph. 9 ref. (S14)

51-S. Bore Profilometer. S. S. Carlisle and R. B. Sims. *Instruments,* v. 26, Dec. 1953, p. 1882-1883, 1906.

For accurate measurements of internal profile of small bores, as in wiredrawing dies. Uses probe and optical-reflection technique. Development, features and performance. Diagrams, photographs. 4 ref. (S15)

52-S. Standard Analyses of German Alloy Steels. *Metal Progress,* v. 65, Jan. 1954, p. 96B.

Data sheet indicating chemical compositions and tensile strength of carburizing and constructional steels. (S22, AY)

53-S. Tell-Tale Paints Reveal Temperature Changes. J. E. Cowling. *Research Reviews, Office of Naval Research,* Nov. 1953, p. 1-5.

Research on a series of paints for temperature range 50 to 278° C. Photographs, tables. (S16)

54-S. Sound Waves Uncover Inner Flaws. *Steel,* v. 133, Dec. 14, 1953, p. 120-121.

Ultrasonic method of nondestructive testing particularly suited for inspection of heavy sections. Photographs. (S13)

55-S. New ASA Standards for Cast-Iron Pipe. Panel Discussion. *American Water Works Association, Journal,* v. 45, Dec. 1953, p. 1266-1280.

Includes "Development of A21 Specifications", Thomas H. Wiggin; "Cast-Iron Pipe Tests", J. Thompson Vann; "Manufacturing Considerations". H. W. Stuart; "Consulting Engineer's Viewpoint", Louis R. Howson; and "Manager's Appraisal", Wendell R. LaDue. Tables, photographs. (S22)

56-S. Lighting for Industrial Inspection. R. L. Zahour and M. E. Haskins, Jr. *Consulting Engineer,* v. 2, Dec. 1953, p. 37-41.

Factors in selecting type of lighting. Photographs, diagrams, table. (S general)

57-S. Iron-Constantan Thermocouple Tables. *Industrial Heating,* v. 20, Dec. 1953, p.2382, 2384, 2386, 2388.

New reference tables published by Bureau of Standards. Graph. 4 ref. (S16)

58-S. Standards for Aluminium Casting Alloys. F. H. Smith. *Light Metals,* v. 16, Dec. 1953, p. 398.

Comparison between British and foreign specifications. (To be continued.) (S22, Al)

59-S. Measurement of Turbine Blade Forms. *Machinery (London),* v. 83, Dec. 4, 1953, p. 1118-1123.

Equipment and techniques employed. Photographs, diagrams, table. (S14)

60-S. How the PRR Uses Non-Destructive Testing. *Railway Age,* v. 135, Dec. 28, 1953, p. 48-49, 51.

Includes photographs. (S13, S14, S15)

61-S. Current Systems of Classifying Tool Steels. George H. Thurston. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 103-104.

Includes table. (S22, TS)

62-S. (Book.) **A.S.T.M. Standards on Metallic Electric Conductors.** 262 p. American Society for Testing Materials, 1916 Race St., Philadelphia, Pa. $3.00.

Standards covering copper and its alloys, copper-covered steel, aluminum, and galvanized steel. Includes tests for resistivity, strength, and hardness.

(S22, T1, P15, Q general, Cu, ST, Al)

63-S. (Book.) **Engineering Statistics and Quality Control.** Irving W. Burr. 442 p. McGraw-Hill Book Co., 300 West 42 St., New York 36, N. Y. $7.00.

Textbook, with emphasis on statistics used in industry. Presents frequency tabulation as a useful tool. Discusses averages and variability with emphasis on those measures which are of greatest use in engineering statistics. Includes normal curve with methods for fitting and testing correctness of fit. (S12)

T

Applications of Metals in Equipment

18-T. Plain Bearings. Some Aspects of the Design of Bearings for Automobile Engines. *Automobile Engineer,* v. 43, Nov. 1953, p. 463-473.

Advantages and shortcomings of various alloys. Ways to select best material. Graphs, micrographs. (T7, T21, SG-c)

19-T. The Use of High Alloy Castings in Heat Treating Equipment. *Canadian Metals,* v. 16, Nov. 1953, p. 28, 30, 32.

Applications of iron-chromium and iron-chromium-nickel castings in recuperators, annealing retorts, and muffles. (T5, J general, CI)

20-T. Producing Piston Rings Calls for Close Tolerances. *Canadian Metals,* v. 16, Nov. 1953, p. 50, 52-53.

Types of rings and machining and finishing operations. (T7)

21-T. High Alloy Castings Resist High Temperature. *Engineering Journal,* v. 36, Nov. 1953, p. 1473-1474.

Discusses iron-chromium and iron-chromium-nickel alloys. Compositions and applications in recuperators and retorts. (T5, SG-h)

22-T. Newer Types of Metallic Recuperators. H. Weineck. *Iron & Steel,* v. 26, Dec. 1953, p. 557-560.

Construction and use of recuperators made of cast iron, steel and heat resistant alloys. 8 ref. (T5, CI, SS, SG)

23-T. Production of Permanent Magnets in a Modern Plant. *Machinery,* v. 60, Dec. 1953, p. 208-210.

Fabrication procedures employed at Carboloy department of General Electric Co. Photographs. (T1, G general, SG-n)

24-T. Non-Ferrous Materials for Springs. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 74-77.

Composition and properties of beryllium copper and nickel alloys. (T7, Cu, Ni, SG-b)

25-T. Production of Tractor Gearboxes. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1035-1044.

Equipment, plant layout and operating procedures. Photographs, diagrams. (T3)

26-T. The Development of a Copper-Silver-Lead Alloy for Bearings. G. Llewelyn. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 215-220.

Tests showed that a copper-silver-lead alloy containing 30% silver and 40% lead possesses most of the usual properties associated with bearing alloys. Graphs, photographs, tables, micrographs. 8 ref. (T7, SG-c, Cu, Ag, Pb)

27-T. Carbon in the Engineering and Metallurgical Industries. IV. Refractories, Electrodes and Other Metallurgical Uses. V. S. Kingswood. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 221-227.

Applications of carbon in iron and steel making and heat treating. Fabrication of carbide tools. Photograph, diagrams, graphs, tables. 21 ref. (T5, T6, H general, C)

28-T. Aluminum in Communication Systems. E. Glaus. *Modern Metals,* v. 9, Nov. 1953, p. 34-35, 38.

Use of aluminum in tele-communications by the Swiss. The latest and most promising developments are in the field of high-frequency transmission. Photographs. (T1, Al)

29-T. Magnesium Gains in Die Casting Field. George Hodgson. *Modern Metals,* v. 9, Nov. 1953, p. 40, 44, 46, 48.

Magnesium is no longer a "substitute" material. It is accepted on an equal status with zinc and aluminum. Economic factors now favor magnesium in many applications. Diagrams, table, photographs. (T general, E13, Mg)

30-T. Magnesium Die Castings. G. F. Hodgson. *Precision Metal Molding,* v. 11, Dec. 1953, p. 40-43, 91-94.

Applications in automobiles, home appliances, business machines and photographic equipment. (T21, T10, T9, Mg)

31-T. Welding Rods, a Production Control Problem. *Steel Processing,* v. 39, Nov. 1953, p. 597-599, 610.

Facilities and procedures for electrode production at A. O. Smith Co., Lancaster, Pa. Photographs. (T5, K general)

32-T. High Alloy Castings in Heat Treating Equipment. *Steel Processing,* v. 39, Nov. 1953, p. 601-603.

Design of equipment for use under conditions of high temperature and pressure. Photographs. (T5, AY)

33-T. (German.) **The Proper Utilization of Aluminum Alloys in the Chemical and Food Industry.** K. Renner. *Chemische Technik,* v. 5, no. 9, Sept. 1953, p. 521-525.

Processing, application and properties of aluminum alloys for reduced consumption of pure aluminum. Examples of application. Diagrams, graphs, photographs, tables. 9 ref. (T29, P general, Q general, Al, Mg, Si)

34-T. Aluminum Conductors in Telephone Cable. C. Kreisher. *Bell Laboratories Record,* v. 31, Dec. 1953, p. 465-469.

Properties of aluminum, advantages of its use in cable conductors and difficulties encountered in this application. Graph, photographs. (T1, Al)

35-T. Platinum in the Finishing, Jewellery and Metallurgical Industries. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 282, 284-286, 288.

Use of platinum metals in jewelry, electrical contacts, electrodes, thermocouples, and artistic and decorative items. Photograph. (T9, T1, T8, EG-c)

36-T. Design and Application of Bronze Slippers in Universal Couplings. J. Robert Lottes. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 123-128; disc., 128.

Case histories indicate that proper alloy selection can increase slipper performance and reduce costs. Diagrams, photographs, graphs. (T5, Cu)

37-T. Which Stainless Steel? Richard E. Paret. *Material & Methods,* v. 38, Dec. 1953, p. 98-101.

Corrosive environment, service conditions and fabrication methods must be considered in deciding which grade of steel is most suitable for given application. Photographs. (T general, SS)

38-T. Metallic Materials for a Steam Power Plant Operating at 1130° F. Herbert Buchholtz, Wilhelm Ruttmann and Rudolf Schinn. *Metal Progress,* v. 65, Jan. 1954, p. 116-120, 180, 182, 184, 186, 188.

Report on construction steels. Data given on compositions, strength properties, provision for safety at high temperatures, intergranular disintegration, stress corrosion, effect of combustion gases and steam, toughness and welding problems. Photograph, table, graphs, micrograph. (T25, Q general, CN, SS, AY)

39-T. Battle Birds. Richard Cheney. *Steelways,* v. 9, Dec. 1953, p. 8-11.

Current research program in guided missiles. Photographs. (T2)

40-T. Aluminium Winding in Electrical Equipment. A. A. Defoe. *Times Review of Industry,* v. 7, new ser., Dec. 1953, p. 28-30.

Applications in motors, generators and transformers. Photographs, tables. 18 ref. (T1, Al)

41-T. Vitreous-Enamelled Aluminium Stock. C. R. Sigler. *Light Metals,* v. 16, Dec. 1953, p. 402-403.

Advantages and uses of structural panels. Photographs. (T26, L27, Al)

42-T. Aluminium Foil as a Thermal Insulator and as a Vapour Barrier. Joseph B. Singer. *Light Metals,* v. 16, Dec. 1953, p. 403-405.

Properties and uses. Graph, tables, diagram. 7 ref. (T27, Al)

43-T. Prefabricated Aluminium Motel. *Light Metals,* v. 16, Dec. 1953, p. 415.

Design and structural details. Photographs. (T26, Al)

44-T. Metalworking in Making Closures for Containers. Walter Rudolph. *Modern Industrial Press,* v. 15, Dec. 1953, p. 13, 16, 18, 20.

Equipment and procedures for making caps and other closures. Photographs. (T10, G general)

45-T. TV Antennas. Big Business for Aluminum Tubing. F. L. Church. *Modern Metals,* v. 9, Dec. 1953, p. 86-88.

Types and fabrication. Photographs. (T1, Al)

46-T. A New Etching Development for Magnesium. H. E. Swayze. *Process Engravers' Monthly,* v. 60, Nov. 1953, p. 334, 339.

Preparation of printing plates. (To be continued.) (T9, Mg)

47-T. Metals for Reactor-Core Construction. Henry A. Saller. *Science,* v. 119, Jan. 1, 1954, p. 4-8.

Problems of the materials engineer in reactor-core construction. Tables, graphs. 16 ref. (T25, P general, Q general, U, Th, Al, Be, Mg, Zi)

48-T. Some Problems in the Development of a 50,000 Ton Press. H.

C. Hood. *Steel Processing,* v. 39, Dec. 1953, p. 642-646, 670.

Design, construction, transportation and erection. Diagrams, photographs. (T5)

49-T. More Life for Big Guns. W. C. Longstreth. *Steel Processing,* v. 39, Dec. 1953, p. 664-666.

Heat treating process designed to maintain accuracy and extend life of gun. Photographs. (T2, J general)

V

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20-V. Magnesium Castings. P. E. Moluf. *Electrical Manufacturing,* v. 52, Dec. 1953, p. 98-99.

Properties, production methods, and typical applications of cast magnesium parts for electrical equipment. Photographs, tables. (T1, E general, Mg)

21-V. Titanium—A Metal of Engineering Importance? P. L. Teed. *Engineering,* v. 176, Nov. 13, 1953, p. 635-637.

Engineering features of titanium and its alloys; civil aircraft costs; uses of titanium and its alloys in aircraft and aircraft engines. Tables. 7 ref. (Concluded.) (T24, Ti)

22-V. The New Metal Titanium. Maurice Cook. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 93-106.

General review of history, occurrence, reduction processes, melting, properties, alloys and applications. Graphs, diagrams, tables. (Ti)

23-V. Titanium Metal and the Future. *Light Metals,* v. 16, Nov. 1953, p. 378-379.

General review. Production, forming, costs and problems of scrap utilization. (To be continued.) (Ti)

24-V. The Aluminum Smelting Industry. *Modern Metals,* v. 9, Nov. 1953, p. 54-56, 58, 60, 62-64.

History, growth, technology, alloys, markets and outlook. Graphs, table, photographs. (Al)

25-V. All-Around Alloy. L. T. Troutman. *Instrumentation,* v. 7, no. 1, 1953, p. 40-41.

Production, properties and applications of beryllium copper. Photographs. (Cu)

26-V. Engineering Coppers. John L. Everhart. *Materials & Methods,* v. 38, Dec. 1953, p. 123-138.

Development of modified coppers to take advantage of one or more of its properties of high electrical and thermal conductivity, corrosion resistance and ease of working and joining. Commercial grades, engineering properties, applications, forming and fabricating, joining practice and cleaning and finishing. Photographs, tables, graph. (Cu)

27-V. Carbon Molybdenum Steels—Materials Data Sheet. *Materials & Methods,* v. 38, Dec. 1953, p. 143.

Composition, physical, mechanical and fabricating properties; thermal treatment; corrosion resistance; applications of five alloy steels. (AY)

28-V. Norwegian Production of Stainless Steels. J. Sissener. *Metal Progress,* v. 65, Jan. 1954, p. 81-83, 164, 166.

Facilities, methods and products of two Norwegian plants. Foundry practice, alloy compositions and mechanical properties. Photographs, table. (SS)

29-V. Titanium in 1953. James R. Long. *Metal Progress,* v. 65, Jan. 1954, p. 105-107.

Developments in production of sponge, melting, production of ingots, improvement by alloying, welding, fabrication, applications. (Ti)

30-V. Postwar European Progress in Wrought Aluminum and Its Alloys. Paul Brenner. *Metal Progress,* v. 65, Jan. 1954, p. 112-115, 194, 196, 198, 200.

Activities in scrap recovery, alloy development, machinability, joining and applications. Photographs, table. (Al)

31-V. "The New Metal Titanium". *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1029-1032, 1076.

Extracts from the Autumn Lecture given to the Institute of Metals by Maurice Cook. Graphs, photographs, table. (Ti)

32-V. (French.) **How to Choose a Light Foundry Alloy.** Charles Roinet. *Revue de l'Aluminium,* v. 30, no. 203, Oct. 1953, p. 375-378.

Two tables present mechanical and physical characteristics, chemical properties, casting and machining possibilities and aptitude to surface treatment of 18 alloys. (Al)

33-V. How to Understand Aluminum, Its Alloys and Tempers. Samuel Storchheim. *American Machinist,* v. 97, Dec. 21, 1953, p. 113-124.

Presents, with minimum of metallurgical terms, introduction to factors necessary to proper application of aluminum. Tables, graphs, photomicrographs. (Al)

34-V. High Silicon Irons. Walter A. Luce. *Chemical Engineering,* v. 61, Jan. 1954, p. 246, 248, 250, 252, 254, 256, 258, 260.

Corrosion resistance, mechanical and physical properties and applications of Duriron and Durichlor. Photographs, tables, graphs. (R general, P general, Q general, T general, CI)

35-V. Aluminum Alloy Reference Sheet. Harry W. Fritts. *Chemical Engineering Progress,* v. 49, Dec. 1953, p. 675.

Data sheet giving applications, corrosion resistance and physical and mechanical properties. (T general, R general, P general, Q general, Al)

36-V. Titanium Metal and the Future. *Light Metals,* v. 16, Dec. 1953, p. 410-412.

Control of impurities, machining, heat treating, markets and applications. (To be continued.) (Ti)

37-V. The Production and Uses of Beryllium. I. A. G. Thomson. *Mining Journal,* v. 241, Dec. 4, 1953, p. 661-662.

Sources and extraction. 4 ref. (To be continued.) (B general, Be)

38-V. A Look Back at Light Metals in 1953. *Modern Metals,* v. 9, Dec. 1953, p. 72, 74-76, 78-85.

Applications, forming, fabrication, powder metallurgy, coatings, brazing, smelting and production trends. Photograph. (EG-a)

39-V. New Metals in Atomic Energy. W. A. Johnson. *Steel Processing,* v. 39, Dec. 1953, p. 659-663, 666-667.

Zirconium, beryllium and uranium are considered. (T25, Zr, Be, U)

40-V. (Book.) **The Manufacture of Iron and Steel.** D. J. O. Brandt. 384 p. English Universities Press, St. Paul's House, Warwick St., London. 15s.

General practices in manufacture of iron and steel; smelting, casting, rolling, welding, and heat treating. (D general, E general, F23, K general, J general, Fe, ST)

41-V. (Book—French.) **(Congress of Heat Resistant Materials.) Congres des Materiaux Resistant a Chaud.** 398 p. 1951. Editions Metaux, 32 Rue du Marechal Joffe, Saint Germain en Laye, Paris. 5000 francs.

Discusses heat resistant materials including refractories, metals, alloys, cermets, and organo-metallic materials. Covers measuring instruments, creep and applications in jet and other high-temperature installations. (Q3, Q4, T general, SG-h)

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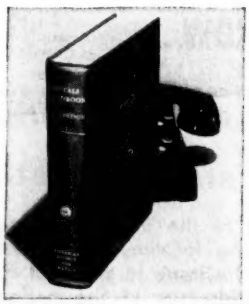

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Table of Contents

It's Later Than You Think, Editorial, *Metal Progress*
Saving Precious Alloys by Intelligent Use of Alternatives
Round Table Discussion, Western Metal Congress
Necessity for Further Conservation of Alloys in Steels, *by John Mitchell*
Boron Steels, by Panel on Conservation, Metallurgical Advisory Board, *D. L. McBride*, secretary
Special Carburizing Steels, Boron Treated, *by Porter R. Wray*

Record of Experience With Boron Steels

Recent Experiences with Boron Steels in Production, *by Harry B. Knowlton*
Use of Boron Steel in Production of Hand Tools, *by Fred J. Robbins and J. J. Lawless*
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WHAT'STHISABOUTBORON?WHAT'STHISABOUTBORON?WHAT'STHISABOUTBORON?WHAT'STHISABOUTBORON?

Neutral Salt Baths Containing Additives Which Eliminate Rectification

PRODUCT	Melting Point	Operating Temperature Range
HARDENING 185-10 (Granular)	820°F.	1000-1500°F.

A Neutral Hardening Bath having a specific weight of 135 lbs. per cubic foot at 1500° F. (2.17 sp. gr.); specific heat 0.208 at 1050° F.

Uses

1. *Tempering high speed steels.*
2. *A neutral quenching bath for high speed steel hardening.*
3. *Spheroidizing of steel.*
4. *Descaling by use of higher percentage of additive to react with scale.*

HARDENING 127-11 and 127-12 (Granular)

1110°F 1300-1650°F.

A water soluble neutral hardening bath having a specific weight of 110 lbs. per cubic foot at 1550° F. (1.70 sp. gr.); specific heat 0.165 at 1275° F.

Hardening 127-12—This compound contains an active carbon which releases some quantities of CO gas in reaction with alkalies. This product should have some benefit in loosening or reducing scale at hardening temperatures and will nullify to a large degree the effect of metal oxides.

Uses

1. *Hardening of SAE or NE steels.*
2. *Annealing.*
3. *Silver brazing.*
4. *Heating bath for austempering or martempering.*

PRODUCT	Melting Point	Operating Temperature Range
HARD BRITE AA-10 (Granular)	1280°F.	1450-2000°F.

A Neutral Hardening Bath for higher temperature work, having a specific weight of 1.57 lbs. per cubic foot at 1850° F. (2.43 sp. gr.); specific heat 0.169 at 1550° F.

Uses

1. *Hardening high carbon high chrome or air hardening steels or tool steels.*
2. *Hardening stainless steels and cutlery.*
3. *Annealing Beryllium Copper.*
4. *Bright hardening of steels and stainless steels.*
5. *Descaling stainless steels.*

HIGH SPEED PREHEAT 13-17-10 (Granular)

1040°F. 1200-1700°F.

A Neutral Salt Bath for tool steels, high speed steels, high carbon high chrome or air hardening steels having a specific weight of 140 lbs. per cubic foot at 1500° F. (Approx. 2.20 sp. gr.); specific heat 0.170 at 1500° F.

Uses

1. *Preheating high speed steels.*
2. *Hardening production parts.*

HIGH SPEED 17-24AA-10 (Granular)

1700°F. 1750-2350°F.

A new Salt Bath for high speed hardening which requires no rectifier for maintaining neutrality. Specific weight 160 lbs. per cubic foot at 2000° F. (2.651 sp. gr.); specific heat 0.159 at 1850° F.

Uses

1. *Hardening high carbon high chrome as well as air hardening steels.*
2. *Hardening high speed steels.*
3. *Copper brazing.*

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